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Monthly Message

Public Law 779 better known as the Doctor Draft Law, will expire on the last day of June 1953 Soveral months ago the Armed Forces Medical Policy Council established an ad hoc committee to study whether a draft law was still needed and if so what form it should take Careful studies of the needs for physicians dentists and veterinarians have convinced the Council that a continuation of a draft law is essential if the health of the Armed Forces is to be maintained As long as an international crisis exists with its requirements for a standing armed force of present proportions no possible rearrangement of health personnel or reduction of ancillary benefits can eliminate this need for a special draft

The Council realizing that the present draft law has certain basic inequities has been studying possible amendments and corrections to be incorporated when the law is submitted to Congress Appreciating that this problem affects not only the Armed Forces but also civilian health personnel resource the Council has sought and will continue to seek the advice of national medical dental and veterinary organizations in the drafting of the new law

The Armed Forces must assume the grave responsibility in the face of a discriminatory draft law which will call into uniform physicians dentists and veterinarian against their will Ours is a deep moral obligation to econo in every possible manner so that the e valuable and hig d persons will be uti lize l to the fulle t extent a ly will leave the Armed Force with a sense of an he privilege of service nof tional a ivance ary medicine as never re ill have an op ate to civilian medicine good f ith for th of our national crisis

Melvin A L H D Chairman
Medical Policy Council
Office e cretary of Defense

ISONIAZID THERAPY IN PULMONARY TUBERCULOSIS

A Preliminary Report *(1)*

FORREST W PITTS *Captain MC U S A.*
FRANK L MILLER *Major MC U S A.*
WILLIAM E DYE *Captain, U S A. F (MSC)*
CARL W TEMPEL *Colonel MC U S A.*
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METHODICAL investigation of the thiosemicarbasone series of drugs in search of a more effective and less toxic antituberculous agent than amithiozone disclosed that the hydrazine derivatives of isonicotinic acid possessed significant tuberculostatic and tuberculocidal properties *(2, 3)* The chemical relationship of nicotinic acid, isonicotinic acid, isoniazid (INH), iproniazid, and amithiozone are illustrated by their structural formulas (fig 1)

INH is rapidly absorbed from the intestinal tract, readily permeates body tissues and fluids, and persists in the circulating plasma for from 6 to 24 hours following a single dose of 3 mg per kg body weight *(4)* Excitement and convulsions have been described in acute toxicity experiments on mice and dogs, whereas, chronic toxicity studies produced anorexia, weight loss, ataxia, tonic and clonic convulsions, and hepatic damage The oral $L D_{50}$ for experimental animals has been reported as 203 mg per kg in mice and 250 mg per kg in rabbits *(5 6)* In vitro studies have shown that most strains of human tubercle bacilli are inhibited by 0 2 micrograms or less of INH per ml of medium *(7)* This

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(1) From the Army Medical Department Research and Graduate School of Walter Reed Army Medical Center

(2) Fox H H Synthetic tuberculostatic agents III Isonicotinaldehyd thiosemicarbazone and some related compounds The Fifth International Congress of Pure and Applied Chemistry (Abstracted paper) p 399 Sept 1951

(3) Grumbach P and Lestrange B Antituberculous activity in vitro of nicotinaldehyde thiosemicarbazone Proc Soc Exper Biol & Med 77 4 50 May 1951

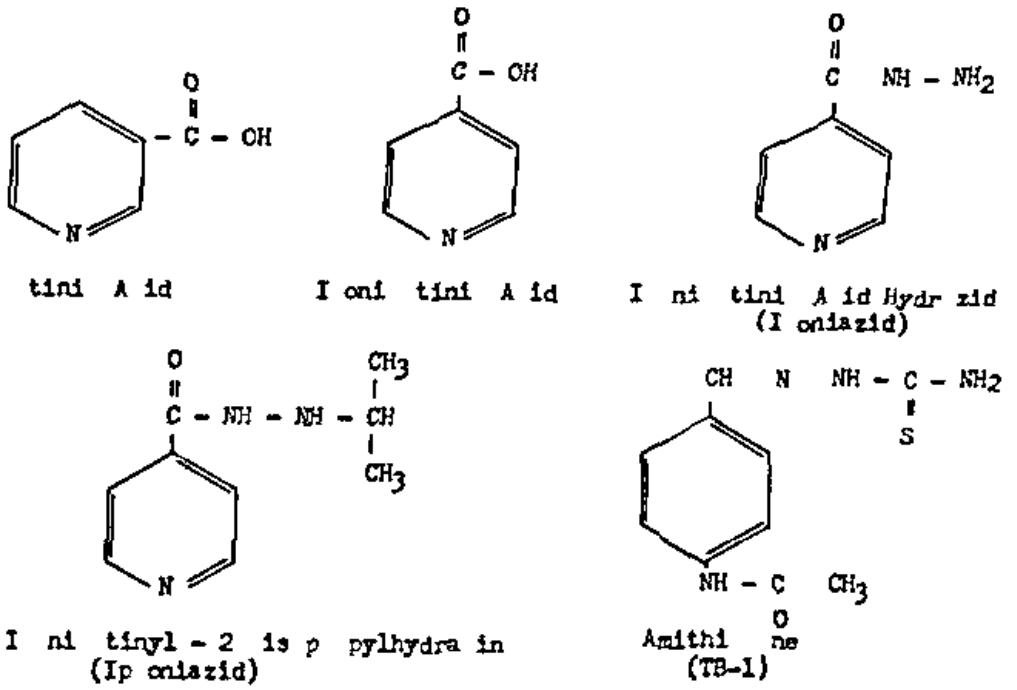
(4) Hinshaw H D F Jr Cawthorne T E Mitchison D A and McDermott W Absorption distribution excretion and bacteriostatic activity of isonicotinic acid hydrazide (rimifon) in man Am Rev Tuberc 65 429-44 Apr 195

(5) Fox H Mc Stasney J L and Rose M D Pharmacologic and toxicologic observations of hydrazine derivatives of nicotinic acid (nicotinic acetylid). Am Rev Tuberc 65 3 (-471 Apr 195

(6) Fox H Hultgren G L Jr Thomas B G H and Burke J C Pharmacology of isonicotinic acid hydrazide (rimifon) Am Rev Tuberc 65 397-401 Apr 1952

(7) Steenken W Jr and Wolinsky E Antituberculous properties of hydrazine derivatives of isonicotinic acid (rimifon and marsilid) Am Rev Tuberc 65 385-3 5 Apr 195

suggests that INH has a wide margin of safety as measured by the therapeutic ratio Preliminary clinical trials with INH in doses of from 2 to 10 mg per kg of body weight revealed favorable therapeutic results *(8 9)*



F gur 1 Stru tural form la of 5 el ted d g

MATERIAL AND METHODS

Since February 195? 196 patients with active pulmonary tuberculosis have received a daily dose of 150 or 300 *mg* of INH orally alone or combined with 2 grams of streptomycin (SM) intramuscularly every third day All patients had disease greater than minimal in extent and sputums or gastric cultures positive for *Mycobacterium tuberculosis* The distribution by regimen and duration of therapy is given in table 1 This report is an analysis of the 104 patients who have completed 120 days of therapy The group consisted of young white male adults almost all of whom had cavitary and/or caseous pneumonic tuberculosis About half of the series had disease which was far advanced The duration of therapy has been 120 days for those patients on INH alone A minimum of 8 months of continuous therapy is planned for those receiving SM and INH but an evaluation beyond 120 days is not possible at this time because of insufficient data.

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(8) Rob rt k E. H d S l kolf I J Hyd der vat f d (m f ma l d) n tr tm f t pr gr eous p umoni tube cul pr l minary port Am Rev Tuber 65 402 428 Ap 1952

(9) Cla k, C. M Elm d rf D F J Ca thon W U d M De m t, W I iaz d (d hydr d) i tr m f m lia y m g l tub ulos Am R T be 66 391 415 Oct 1952

RESULTS

In general, the symptomatic response in all groups was favorable as measured by decreased cough, sputum, and fever and improvement in appetite and weight (table 2)

TABLE 1 *Distribution of patients*

Regimen	Number of patients	
	Total	Number who completed 120 days of therapy
150 mg of INH daily	57	49
300 mg of INH daily	13	6
150 mg of INH daily and 2 grams of SM every third day	51	49
300 mg of INH daily and 2 grams of SM every third day	75	0
Total	196	104

INH alone Fifty five patients completed 120 days of treatment with INH alone Of these, 39 had been treated for chronic pulmonary tuberculosis for periods ranging from 6 to 24 months with rest, collapse measures, and other antituberculous drugs without modification of a generally poor prognosis for survival or longevity These patients were selected primarily to study drug toxicity and to obtain positive bacteriologic specimens on completion of drug therapy in order to evaluate the emergence of resistance The remaining 16 patients were recent admissions who had had no previous chemotherapy for tuberculosis and received no antituberculous measures except bed rest in the first 4 months of INH administration The clinical and roentgenographic results after 120 days of INH therapy are summarized in table 3

TABLE *Weight change in 104 patients treated 120 days*

Change in weight (lb)	Percent of patients
Gain of more than 3 and less than 5	9 6
Gain of more than 5 and less than 10	1 3
Gain of more than 10	44 2
o change	20 2
Loss of more than 5	8

TABLE 3 *Ro tge g ph c al t o fp t t t d w th INH f 120 d y*

Factor val ted	O tginal tr tm t w th 150 mg of INH d ly	R tre tm t with		Or g l tre tm t w th 150 mg f INH d ly nd SM q 3d d y
		150 mg f INH daily	300 mg f INH daily	
Numb r fp t en	16	33	6	49
Imp o d	14	9	2	44
Slightly	(14)	(7)	(2)	(27)
Moderat ly	(0)	(2)	(0)	(16)
Mark dly	(0)	(0)	(0)	(1)
N ch ng	2	23	4	5
W d	0	1	0	0
Ca ty lo t to t w	0 f 12	0 f 23	0 f 5	14 of 35

INH combined with intermittent doses of SM The 49 patients in this series were new admissions without previous treatment and received no antituberculous measures except bed rest in conjunction with drug therapy during the period of evaluation The results in this group as measured by roentgenographic evaluation are shown in table 3

TABLE 4 *Bacteriologic evaluation on 55 patients treated with INH for 120 days*

Days of therapy	0	30	60	90	120
Positive	55	29	26	18	21
Sensitive	(55)	(29)	(19)	(10)	(11)
Resistant	(0)	(0)	(7)	(8)	(10)
Negative	0	26	29	37	34

Bacteriologic evaluation Sputums or fasting gastric washings were collected from each patient prior to and at 2 week intervals during therapy Each specimen was concentrated using the trisodium phosphate method and inoculated on a tube of ATSC (American Tuberculosis Society Committee) medium Positive cultures were subcultured into tween-albumin liquid medium and drug sensitivity studies performed using ATSC medium containing 0, 0 2, 1, and 5 micrograms of INH or 0, 1, 10, and 100 micrograms of SM per ml Cultures showing growth on 1 microgram of INH or on 10 micrograms of SM per ml equal to that on the control were arbitrarily called resistant.

TABLE 5 *Bacteriologic evaluation on 49 patients treated with INH and SM for 120 days*

Days of therapy	0	30	60	90	120
Positive	49	19	5	1	2
Sensitive	(49)	(19)	(5)	(1)	(2)
Resistant	(0)	(0)	(0)	(0)	(0)
Negative	0	30	44	48	47

The preliminary bacteriologic data for both regimens are summarized in tables 4 and 5 All cultures obtained prior to the initiation of INH therapy were sensitive to this drug (no growth or few colonies on 0 2 microgram per ml) and those from patients receiving SM were sensitive to this antibiotic. Because of the large number of retreatment cases in the group receiving INH alone no valid comparison of the incidence of bacteriologic sensitivity in the 2 groups could be made, but it is significant that 32 percent of the e patients positive on completion of drug

therapy yielded organisms in their sputum completely resistant to 1 or more micrograms of INH per ml The extremely high rate of sputum conversion (96 percent) with the combined INH SM regimen was the greatest encountered on any treatment regimen investigated at this hospital to date

Although there was not sufficient evidence to correlate loss of clinical response with any exact level of INH resistance experience with other antituberculous drugs indicated that the development of a several fold increase in bacterial resistance limited the therapeutic effectiveness of any given agent In these series of patients the emergence of bacterial resistance during INH therapy appeared to be markedly delayed by the concomitant and intermittent administration of SM

Toxicity Clinical toxicity has been virtually nil The absence of gastrointestinal irritation combined with ease of administration assured excellent patient acceptance in every instance Occasionally constipation could be attributed to INH but at no time was it a clinical problem A few patients experience mild nervousness and insomnia. Increased muscular irritability and weakness were noted in 2 patients Hyperreflexia occurred in about 5 percent of the patients The previously reported urinary frequency dryness of the mouth bronchospasm and idiosyncrasy to sympathomimetic drugs were not observed in this study using the above doses One patient developed a drug fever of 102 F which necessitated discontinuing INH therapy

The renal hepatic and hemopoietic systems were evaluated at frequent intervals Transient albuminuria varying from a trace to 1 plus was noted in 71 percent of the patients Sixteen urinalyses were performed on each patient in the 120 day period of drug administration and it was unusual for albuminuria to appear in more than 3 specimens Two plus or greater degrees of albuminuria were *not* observed An occasional hyaline or granular cast per low power field appeared transiently in 32 percent of the patients and 50 percent had an occasional red blood cell per high power field in the urine at infrequent intervals No disturbance of renal function as measured by blood urea nitrogen retention or 15 minute phenolsulfonphthalein excretion test occurred Low grade eosinophilia, varying from 5 to 15 percent of the total white blood cell count, was encountered in 74 percent of the patients but it was always transient. No instance of anemia leukocytosis leukopenia or agranulocytosis was observed All cephalin cholesterol flocculation tests performed at monthly intervals were normal Although 3 patients had slightly increased bromsulphalein retention (up to 12 percent in 45 minutes) on single occasions during the course of monthly evaluations all were normal on completion of therapy

DISCUSSION

Combined drug regimens have proved to be superior to the administration of single antimicrobic agents in the treatment of pulmonary tuberculosis *(10)* This fact appears to be reaffirmed by preliminary studies at this hospital in which the response to INH alone was compared with results obtained when this drug was combined with SM Because the latter regimen appears to be a most promising method of applying this new agent, it is appropriate to discuss its present role in the therapy of tuberculosis

TABLE 6. *Comparison of SM PAS and SM INH regimens in the treatment of tuberculosis—preliminary evaluation*

Attributes of a good regimen	SM-PAS	SM-INH
Therapeutic effectiveness based on roentgenographic response symptomatic response and sputum conversion	Excellent	Excellent
Drug toxicity	Slight	Slight
Bacterial resistance	None in 4 months 1 5 percent in 8 months	None in 4 months
Ease of administration	Good	Excellent
Patient acceptance	Good	Excellent
Suitability for prolonged use	Excellent	Unproved
Reasonable cost	Low cost	Low cost

No t d es of pr long d tre im nt at r avail ble bout 1 more y r will be required to e lust th s r gim n

As new drugs are made available for clinical trial in the treatment of tuberculosis there always follows the problem of comparing their effectiveness with regimens of proved value It becomes a matter of utmost importance, therefore, to have an acceptable yardstick of measurement in order that proper evaluations can be made

The present problem of comparing the SM INH regimen described with the generally accepted regimen using SM every third day and para aminosalicylic acid (PAS) daily is an example of this need Unfortunately the SM PAS treatment has certain drawbacks and it is only natural that the new found combination of SM INH which is more easily administered, should gain in

(1) [illegible] Mat n R. I Dye T E. and Tempel C. T Combined intermittent streptomycin treatment of secondary pulmonary tuberculosis comparison of streptomycin every third day and para-aminosalicylic acid daily with streptomycin every third day and para-aminosalicylic acid every third day Dis Chest 21 1 16 J 19

popularity The latter regimen may be found to be the best available in the next year but clinical investigation still favors SM PAS as the regimen of choice This fact is established by comparing the attributes of both regimens (table 6) This comparison is made not only to reveal the present status of the new regimen but to illustrate how the problem of evaluating any new combination of drugs in the future may be approached

Therapeutic effectiveness Both regimens are effective but sufficient studies are not available for final comparison of long term use From preliminary investigation it would appear that the symptomatic and roentgenographic responses are of similar magnitude but a higher incidence of sputum conversion at 4 months is noted with SM INH The comparison at this time is difficult to make but the findings favor SM PAS because more complete data are available

Toxicity There appears to be little difference in drug toxicity to date to favor one regimen over the other Complete evaluations however are not available for SM INH Lacking this data we must necessarily favor SM PAS

Bacterial resistance To date bacterial resistance to the drugs of either regimen has not developed at 4 months At 8 months resistance to SM PAS is not a serious problem Such studies are not available on SM INH

Ease of administration Compared to PAS INH is easier to administer because of the smaller dose required When PAS is used in solution there is the added problem of its proper preparation in the hospital pharmacy, and the additional one of nursing care required to ensure that patients take the medication INH is easier to give parenterally than PAS—a factor in its favor

Patient acceptance There would appear to be a clear cut preference for SM INH by the patients PAS is required in large doses and often causes severe gastrointestinal distress Unless the nurse or ward attendant stand at the bedside while the patient takes PAS there may be little assurance that the drug has been taken In view of the well known development of resistance to SM when not protected by the simultaneous administration of PAS the factor of patient acceptance of medication assumes great significance

Suitability for prolonged use SM PAS regimens can be used effectively and continuously for 8 months or more with little danger of drug reactions and with a rather low incidence of bacterial resistance This cannot yet be said of SM INH because of insufficient experience with this combination Because long term regimens are not required in the treatment of most lesions

of pulmonary tuberculosis having a serious necrotic component, this factor makes SM PAS clearly the treatment of choice at present.

Reasonable cost There is little or no difference in the cost of either regimen Each can be administered for about 10 cents daily

SUMMARY

Isoniazid was given by mouth to 196 patients with pulmonary tuberculosis for 120 days in doses of 150 or 300 mg daily alone or combined with 2 grams of streptomycin given intramuscularly every third day A preliminary evaluation of the 101 patients who completed 120 days of treatment on these regimens indicate that isoniazid is an effective agent in the treatment of pulmonary tuberculosis It did not cause serious toxicity in this dosage during the first 4 months of therapy The effectiveness of the drug was slight in this dosage when employed alone and drug resistant organisms emerged rapidly in a high percent of patients Limited data suggested that the combination of isoniazid and streptomycin enhanced the therapeutic effectiveness and delayed the emergence of tubercle bacilli resistant to both agents Final evaluation of isoniazid will depend on a more complete analysis based on a large series of patients treated for from 8 to 18 months with continuous combined drug therapy

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BOOKS RECEIVED

The History of American Epidemiology by *C. E. A. Winslow* Dr P H Professor Emeritus Yale University School of Medicine Editor American Journal of Public Health *Wilson G. Smillie* M D Professor and Chairman Department of Public Health and Preventive Medicine Cornell University Medical College *James A. Doull* M D Medical Director Leonard Wood Memorial (American Leprosy Foundation) and *John E. Gordon* M D Professor and Chairman Department of Epidemiology School of Public Health Harvard University Edited by *Franklin H. Top* M D Professor of Epidemiology and Pediatrics College of Medical Sciences University of Minnesota Sponsored by *The Epidemiology Section, American Public Health Association* 190 pages illustrated The C V Mosby Co St Louis Mo publishers 1952

The 1952 Year Book of General Surgery (June 1951 May 1952) edited by *Evarts A. Graham* A B M D Emeritus Professor of Surgery Washington University School of Medicine Formerly Surgeon-in-Chief of the Barnes Hospital and of the Children's Hospital St Louis with a section on Anesthesia edited by *Stuart C. Cullen* M D Professor of Surgery and Chairman of Division of Anesthesiology State University of Iowa College of Medicine and Hospitals 640 pages illustrated The Year Book Publishers Inc Chicago Ill publishers 1952 Price $6.

E s ttial f Body Me h cs in H lth d D e by *J l E Goldthw t* M D F A C S Ll D Sc D *Ll yd T B w* M D F A C S *L ng T Sua m* M D d *J b G K h* M D F A C S S D 356 p es llu t t d 5th d t J B L pp tt C Ph l d lph P p blı h 1952

Bı l g cal Ch m try A I t d t t B h m try by *Ale d G* Ph D A s c P f f Ph m logy H h m M d l C ll g Ph l d lphı F m ly A o t P f f Ch m y *V ll a C ll g V ll P 340 p g ll t t d Th Bl k* co C New Y k N Y p bl h 1952

U d ta d g Old Ag by *J a G. G lb t* Ph D D pl mat Cl l P y h logy Am ca Bo d f E m P f l P y h l gy L tur P y h l gy F dh m U ty G d t S h l d L g Isl d U ty G d t S h l 422 p g Th R ld P Co N w Y k N Y p bl h 1952 P $5

D f the H t d A t ttes A t mı l d F t l D turba f th C lat T tm t by *G ge R H rm* M S M D Ph D F A C P *P f f M d U ty f T* D t f th C d l S d H t Stat n U t ty H p t l C lta t V l D U tt d Stat Ma H p tal C lt t M d t S g G l U t d St t A my 4th d t 652 pag ll t t d Th C V M by C St L ı M p bl h 1952

Th Ph l phy of Psy hı try P y h t P l g m na by *Ha ld Palm* M D 70 p g Ph l ph l Library N w Y k N Y p bl h t 1952 Pr c $2 75

Sh ck d C eul tory Hom ostas s Tra t f th F t Conf e Oct be 22 23 1951 New Y k N Y d t d by *H ld D G* M D P f of Phy l gy d Ph ma l gy B wma G y Sc l f M d W k F C lleg Wı ton Sal m N C Spo ed by th *J ab M y J F nd t* N w Y k N Y 245 pag llustr t d P t d by C l Ma y & Co I N w Yo k N Y 1952 Pr $3 50

Po t-operat ve Ca by *H J B. Atk* D M M Ch (O) F R C S (E g) Surg d D t f h D p m t f S g y G y *ll p t l 4th ed on 338 pag illustr t d Cha l* C Th ma P bl sh Sp gf ld Ill 1952 P $6 75

X-ray Dı gno ı of Ch t D sea by *C l ma B. R b* M D A ta t Cl cal Profe of Med C ll g of Phy ıans d S g C lumb U ıty A t Phy ı n f Ch t D d A t R d olog t Mt. S nat H p tal C lt g Phy ıa fo Ch t D ea es B th El H p tal S C ulta t f r Ch t D V t r Adminıst t 208 p g ll tr t d Th W ll m & W lk n C B lt m Md p bl h 1952

Nur e H ndbook of Ob t trics by *Lo Zab k* R N Fo m ly N ght S p rv s Ly g In H p tal N w Yo k N Y nd Fı ld D t Ma m ty C t r A oc t N w Y k N Y D t Mat rnity Con ultat S ı N w Y k N Y L tur r n th School f Ed t D pa tm t f N Ed at o N w York U y N w York N Y d *N h l J E tman,* M D P f f Obst tı ı th John H pk U ı ıty d Ob tet ı ı -Ch ef t the Johns Hopk l p t l 9th ed to c mpl t ly ı d 695 pag ill trat d J B L pp cott Co Ph l d lph P p bl h t 1952

DYNAMIC CYTOLOGY IN EXPERIMENTAL MEDICINE[1]

CHARLES M POMERAT Ph D [2]

THE purpose of this report is to argue the case for the extension of two research goals (1) the study of cells in the living state with modern tissue culture methods, and (2) a wider use of readily available human cellular resources In pleading my case, one of the difficulties with which I am faced is what the French refer to as "le grand embarras de l'embarras" The last 5 years have shown an extraordinary renaissance in the use of the tissue-culture method for the development of commercial and synthetic media to promote cellular growth, the cultivation of small but entire organs such as the bones and the endocrine glands and the examination of cells with phase and electron microscopy and for numerous important areas of fundamental biology Indeed, a description of the achievements of D Wilton Earle and his associates at the new Bethesda the perfection of pure clonal and mass cultures available for precise quantitative studies would be adequate to defend my thesis However, I want to draw from recent contributions of the fair city of Houston's fabulous Texas to establish my position

Both tissue-culture preparations will be considered briefly to illustrate procedures by means of which accurate data have been obtained regarding human cell morphology and the problems which appear to be challenging in the effective introduction to efficient performance for inquiries which may prove of significant practical medical importance

CHROMOSOMAL PATTERNS AS REVEALED BY TREATMENT OF CELLS IN TISSUE CULTURE WITH HYPOTONIC SOLUTIONS

It is well known that advances in the study of normal and abnormal chromosome have largely resulted from the use of large numbers of the cells of small cell strains such as the fibroblast strains of connective tissue However it was soon found [illegible]

[illegible]

simultaneously by Hughes *(4)* that two controllable experimental situations can be used to overcome these difficulties

1 Cells in tissue culture are characterized by emigration and consequential flattening Thus columnar epithelium typically becomes modified to produce extensive pavements of single layered well extended thin cells This was especially well illustrated recently in outgrowths from the amphibian lung *(5)* In adult human epidermal cells the area of the nucleus was found to increase by about 100 percent and the area measured at the margin of the cytoplasm increased 200 percent between the third and tenth days of culture *(6)* Some of this increase may have been due to hydration and adjustment to the nutritional conditions of life in vitro but the change in area was attributed primarily to the redistribution of nuclear and cytoplasmic content of cuboidal cells after their removal from the closely packed conditions found in the intact skin to the open" conditions of life in a plasma clot.

2 The well known effect of hypotonic solutions in swelling cells can be added to the advantage derived by the expanding and flattening of cells in tissue culture Such cells may be treated with a balanced salt solution as formulated by Gey and Gey *(7)* consisting of 20 parts full formula and 80 parts full formula less sodium chloride After contact for 3 minutes with such a hypotonic solution prophase nuclei of spindle cells from human malignant ascitic fluid have been found to increase from a diameter of 20 microns to one of about 30 microns This process was found to be reversed within at least 16 minutes by replacing the medium with the isotonic physiologic solution Cells fixed for cytologic staining following treatment for 20 minutes with hypotonic solutions revealed widely spread chromosomes which could be readily counted and studied for individual detailed structure The method, together with typical examples of mammalian chromosomal patterns has been described by Hsu and Pomerat *(8)*

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(4) H gh A. Som fl t f b ormal ty d ding ll b k Tur Quar J Micr Sc 93 207 219 J 1952

(5) Da B Pulm ary p th l m f wt T ru d udied l g Tur w th m gr ph ppa t d ph se tr t h q J E p Zo l 112 417 447 Dec 1949

(6) H T C. T ul t d huma ki m yt l g l f tur f g wh f p h l l ll T xa R p B l & M d 10 336-352 1952.

(7) Gey G O d Gey M K. Maint f h ma no m l ll d t m ll t ltur pr l minary rep rt lt of m bl t t mor d norm f t d m thod f cult vati Am J Ca r 27 45-76 M y 1936.

(8) H T C. d P m t C. M. M mmal h m m tr m thod f p d g ch m m f ll t ltur l p

Figure 1 exemplifies the type of chromosomal distribution which can be obtained from normal human cells, and in figure 2 aneuploidy is seen in a cell from a culture of a liposarcoma

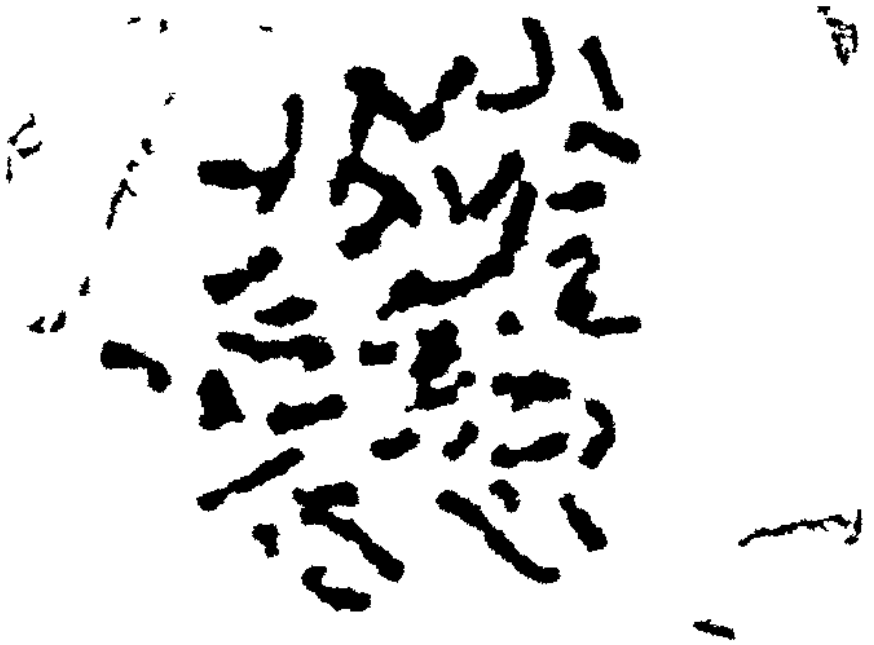


Figure 1. A 4-day-old tissue culture preparation of human fetal spleen showing characteristic individualization of chromosomes in early metaphase resulting from treating emigrated cell with a hypotonic solution 20 minutes before fixation with methyl alcohol and staining according to Jacobson's method (May-Grunwald and Giemsa stains) X 1450

Current investigations on human cells are concerned with two fundamental problems

1 The determination of the range of variation in chromosome counts for various species of tissues Evidence obtained thus far has shown that there were from 44 to 49 chromosomes in the spindle cells emigrating from the spleen of a 4 month fetus Should various tissues and organs show characteristic chromosomal variation new inroads might be made on the problem of differentiation

It is hoped that the well known phenomena of aneuploidy and polyploidy of tumor cells may be examined more closely Borderline malignancies may be classified with more accuracy with the use of well spread chromosomal preparations, the clinician hopes in turn that their prognosis be more accurately foretold



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THE USE OF CELLS FROM THE NASAL MUCOSA FOR EXPERIMENTAL STUDIES

Biopsy specimens from unanesthetized adult, human nasal mucosa have been shown to produce excellent outgrowths of epithelial cells in simple hanging drop cultures *(9)* When the tissue is derived from the posterior portion of the middle turbinate ciliated cells are obtained which how typical activity in the outgrowth for more than 8 days Moreover if such explants are cultivated in a semifluid medium they form minute globes which rotate actively like some of the lower Metazoa Although this preparation might prove valuable for the analysis of ciliary motion particularly with reference to the anesthetics of the inhalant type our work has been primarily directed at the study of non ciliated epithelial sheets grown in ordinary plasma clots Time-lapse phase contrast cinematographic records have made possible the study of the emigration of elements from primary explants, the behavior of cell membranes at the free margin—particularly in relation to cell drinking (pinocytosis) the activities of wandering cells and related phenomena

(9) R J M P m C M d D B T ltu udi f l t d
l m ma p l m ry r p An R 104 409-419 A g 1949

Using a perfusion chamber by means of which cells may be treated with solutions containing various chemicals while moving picture records are being made *(10)*, challenging opportunities are offered for studies on the action of noxious agents It is suggested that the effect of poisonous gases and bacteria might be examined with this technic, using not only the nasal mucosa but epithelium from other parts of the respiratory tree Human pulmonary tissue, available in any hospital with an active division of thoracic surgery, yields an abundant supply of study objects Tissue cultures of nasal mucosa and of skin *(11)* form a part of a cadre of investigations dealing with allergic manifestations in which clinical studies can be extended to the examination of cells under the highly controllable conditions of the tissue culture within the perfusion chamber from particular patients Thus it is feasible to confront mucosal epithelium with antigens histamine, and antihistaminics in a situation where cinematographic records can be made to reveal the action of these variables on particularly mobile portions of individual cells Although the broad scope of this problem has been outlined *(12)* current studies are primarily directed at establishing an adequate base line against which the action of various substances may be measured In the course of this phase of exploration it was found that occasionally the nuclei of mucosal cells in culture showed rotatory activity A description of the methods employed in the study of this type of movement will serve to illustrate the technic of film analysis

Sequences showing particularly active nuclear movement were projected by means of a photo enlarger and outline drawings were made from selected frames on tracing paper Using the fact that one of the two nucleoli of these cells is typically smaller than its fellow, a pencil line was drawn through both nucleoli and from this the angle of rotation could be measured by means of a protractor Figure 3 represents typical results for a cell which showed alternating counterclockwise and clockwise movements It will be noted that the frame numbers serve for the precise determination of the time relations One sequence showed 15 rotations in 70 minutes The fastest complete rotation required only 70 seconds In a report of these results *(10)* it is suggested

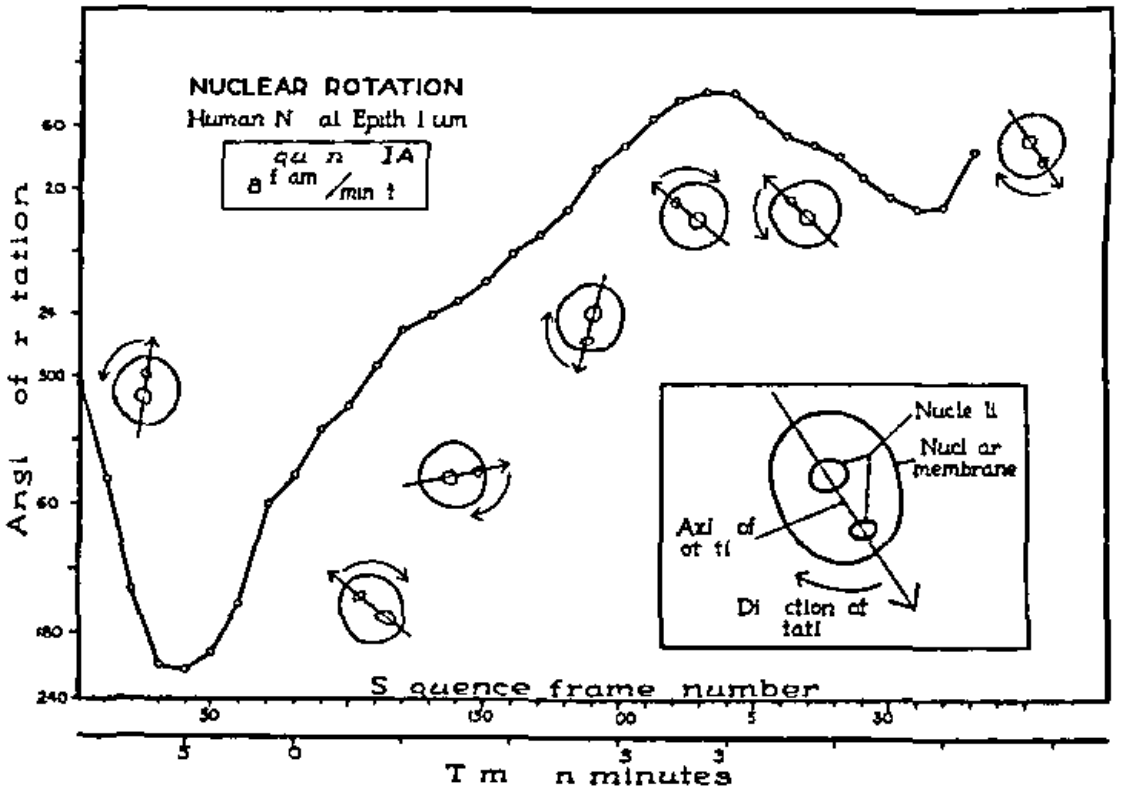
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(II) E rr E T Li en C S P rt C M a u F cultur ta on mas k II Com a ve ef c of cort ect c d nt c legens on se m en t e human k J Invest Derm t I 193 Su I

(I) P rt C M Observ s for stud r spo se e human r c l s in cultur L r

(II) P rt C M P t n cl a tiss cu ture f hum nasal mucosa r m

that tne two essential directions for future work should attempt to describe the mechanism of rotation and its possible functional role Current studies therefore involve observation on the effect of barometric and osmotic pressure temperature pH and related factors on the rate of rotation The possibility that the phenom enon is associated with the distribution in the cytoplasm of nucleic acid products formed in the nucleus is being examined



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EPIDERMAL CELLS DERIVED FROM SKIN GRAFTING PROCEDURES EMPLOYED AS TEST OBJECTS

As is the case for many other tissue sources small remnants resulting from skin grafting procedures are regularly made avail able by active teams of plastic surgeons for explantation in vitro Since 1949, adult human skin in tissue culture has been used for the preparation of a dozen scientific reports This work has followed 4 main directions

1 The biology of human epidermal cells as exemplified in a cytologic study by Hsu *(6)*

2 The toxicity of various dru_s used by dermatologists for topical applications This work has been conducted primarily by Livingood and his associates (cf *14 15)*

3 The effect of radioactive substances on human skin explants in a perfusion chamber A method for the study of P^{32} has been outlined *(16)*

4 Skin storage, autograft and homo_raft reactions, and the effect of wound healing agents' on human epidermal cells in vitro *(17–19)*

This statement may serve to emphasize how rewarding human material may be as approaches to practical clinical problems when employed with currently available tissue culture methods A full discussion of results obtained, particularly in relation to surgery, will be reserved because a more extensive report of these studies will be made in Washington at the November meeting of the Subcommittee on Burns of the National Research Council

DYNAMICS OF HUMAN BRAIN CELLS

Studies dealing with the relative toxicity of central nervous system stimulants and depressants, based on the outgrowth of nerve fibers from the spinal cord of 9 day chick embryos *(20)*, led Ewalt to urge us to undertake the systematic cultivation of biopsy specimens taken in the course of psychosurgical proce dures The work was later extended to include a study of brain tumors in vitro with the co operation of Dr I Costero at the University of Mexico To date tissue cultures have been prepared from a total of 197 human brains including material from pre-

(14) E er tt E T Pomer t C M Hu F N and L ving d C S T ss culture stud on h m sk m th d of luat g tox ity of tt i dr gs empl yed foc lly on sk n skin t c ty m th d T xas R p B l & Med 9 281 291 1951

(15) H F Living od C S J hnson P a d P merat C M T s u cultur t d'e huma ski C mparat t xic ff cts of a t b t cs o tissue ulture explant f human skin and embryoni chick pl In pr

(16) Hu F N Holm S G P m rat C M Li i go d C. S a d McCo n ll K P M th d f r studyi g eff t of P^{32} o li i g ad lt human ep dermal c lls in perfusion ch mber Te a R p B l & Med 9 739-748 1951

(17) Allg wer M Bl k r T G Jr and Engley B W D Som immun log c l aspects f to- a d h m gr fts n r bb ts te ted by i vi o and vitr technique Pl t & R c nstruct Surg 9 1 21 J n 1952

(18) Allgow r M nd Blocker T G Jr V bility of skin in relat n to vario s method f torag T Rep B l & M d 10 3-21 1952

(19) Allg wer M Pomer t C. M nd Blocker T G Jr Infl ence of n rm l serum its d ti ti s and of wo d h ali g ag nt on huma ep dermis vitro Ann Surg 135 923-937 J e 1952.

(20) P nt r J Pomer t C M. and Ezell D Eff ct of s b t c s known to f t ity of n rvous sy tem on fiber o tgr wth fr m living embryonic chick pin l c rd T R p B ol & Med 7 417 455 1949

frontal lobotomies (67 performed for treatment of psychiatric disorders and 7 for the relief of pain) The series also include 97 intracranial tumors Thus far two important phenomena have been uncovered

1 Neurons not only survive in vitro but emigrate from ex plants of cerebral cortex of the adult human brain *(21 22)*

2 Glial elements frequently exhibit rhythmic pulsatile activity This has been particularly well illustrated in cultures of the spinal cord of the adult cat With the use of explants from the corpus callosum of the rat *(23)* and of the human cortex *(24)* oligodendroglia have shown a rate of about 1 contraction per 5 minutes In addition to this behavior the study of living neuroglial cells reveals continuous activity of the cytoplasm at the margin of their processes The addition of the fixatives generally em ployed for neurologic metallic impregnations has been shown with the perfusion chamber method to damage the characteristic features of these mobile ectoplasmic structures Out of these studies it has been argued that many of our conclusions concern ing neuroglia are "silver plated both in the sense of what is learned by the study of textbook illustrations and with regard to our concept of the role of glia in relation to the metabolic activity of the neurons It has been suggested *(25)* that in addition to their mechanical role as framework elements glia of living nervous tissue subserve a nutritive role This is thought to in volve two dynamic propulsion systems

1 *Interstitial (interneuronal) fluid movement* This is believed to be produced in large measure by the activities of undulant membranes along the course of the processes of astrocytes The specialization of foot processes not only provides points for attachment and determines polarity but perhaps also plays a role in relation to the so-called "blood brain barrier The argu ments used to demonstrate that ordinary fixation contracts relatively broad and thin cytoplasmic expansions to mere strands is used to explain the classical illustrations of the stringlike foot processes encircling blood vessels In the living state these may completely invest systems of physiologically important vessels Studies on the character of the matrix or ground sub

(21) C. M. E ... S odgr S R d Orr M. F T ul ur f d reb l rt R p B l & Med 8 108-109 1950

(2 I and P m l t f eur fr m d lt hum er b l d Am J 467, 1951

(23) t E d f ligodendr cyt t su ltur J Exp 103-114

24) P P l t l man brain in u cultur J & 0-449 P

stance of nervous tissue are urgently needed for the completion of a theory of extracellular fluid movement

2 *Parenchymatous (intraneuronal) or neuroplasmic fluid movements* Cells exhibiting rhythmic pulsatile activity, such as oligodendroglia, are precisely those which are found in close association with the perikaryon and axonal processes of neurons If their processes in the living state actually consist of extensive foliose membranes clasping the neurons rather than the dissected and nubbin studded strands characteristic of metallic preparations

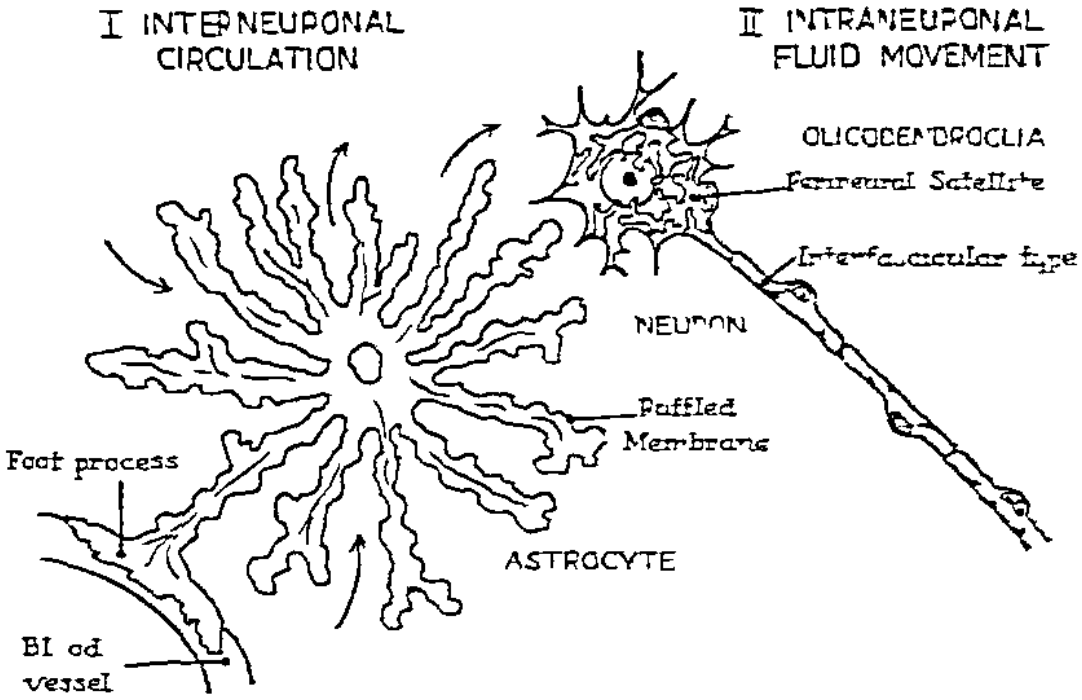


Figure 4 Diagram suggesting two types of propulsive mechanisms which may be produced by glial cells in subserving neuronal metabolic function. The mobility of the ruffled membranes of astrocytes may be involved in providing a factor for the movement of fluid (arrows) in the ground substance (interneuronal circulation) By means of rhythmic contractile activity of oligodendroglia, which clasp the perikaryon and processes of nerve cells may assist in the displacement of neuroplasmic material (intraneuronal fluid movement)

rhythmic contractile activity might serve to exert a gentle "massaging" action on the neuroplasm Perhaps this is one of the factors in the long-sought-after "motive force" for the elongation of nerve fibers (cf 26) These considerations might also prove valuable in relation to current theory regarding the transmittal of nuclear formed substances into nerve processes as developed primarily by Swedish observers (cf 27) An anatomic

(26) Weiss P (editor) General Neurology University of Chicago Press Chicago Ill 1950 pp 1 39

(27) Hamberger C A and Hyden H Transneuronal chemical changes in Deiters nucleus Acta oto-laryng Supp 94 pp 82 113 1 49

basis for a remarkably continuous plexus of enveloping glial cells even in the autonomic ganglia is available for the extension of this proposal (cf *28*) (fig 4)

The cytologist is justified in re emphasizing that man is a useful experimental animal There is a tragic daily waste of important cellular experimental material in the discarding or the complete formalin fixation of surgical specimens and of body fluids Ascitic fluid for example not only is found to be interesting for the galaxy of cells it provides as test objects *(29)* but it is valuable as an unusually rich and inexpensive supply of nutrient material apparently ideally suited for the cultivation of human tissues

The animal body is constantly casting out normal and pathologic viable cells One of the most neglected opportunities in the cancer field appears to be the conversion of exfoliative cytology from a static to a dynamic approach Many cells from prostatic secretion *(30)* and from breast fluid *(31)* have been shown to become well established in vitro where their genetic history pathology and reaction to sterols may be studied under experimental conditions for many weeks Without hazard to the patient many inquiries can be made with the use of human cells Tissue samples such as the buffy coat of human blood should afford an opportunity for evaluating cellular individuality in a manner comparable to that provided the biochemist in his use of blood serum

Methods particularly adapted for tissue culture work in medical installations have been described by Murray *(32)* together with other modern procedures for the study of living cells It is hoped that investigators whose vision is excited by the possibilities offered by the study of living human cells will look forward to the cross indexed bibliography of tissue culture which is in the final stages of preparation by Murray and which comprises more than 18 000 articles

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(28) del R H g P P l k M d P d J M. E di b l ur gl p T l ur glia d l g gl t R So arg t d b l 18 159-168 J 1942

(29) P m C M N w ki W W d R G G T l ur f ll fr m body fl d T R p B l & M d. 8 521 532 1950

(30) Co R E Ho k C. A. P m t C. M. d R G Co l t tud p fl d p t t ue d w th h p th l g l P pa l m ar d t ul t b q T Rep B l & M d 7 462 467 1949

(31) P m C M M p ctur t d f l g pap ll ma f br ast d b ca T R p B l & fed 10 217 227 1952.

(32) Mur y M R T ltu p dur m d l in ll tu In V her M. B (d tor in h f)- M thod M d l R h Y ar Bo k P bl h l c. Ch cag Ill 1951 \ l 4 pp 211 216

Finally, it is with no disrespect to the established dicta of animal experimentation that it is pointed out that occasionally we may perform our experiments with far greater profit by direct experimentation on human cells Hormone-target tissue phenomena often cannot be translated directly from the level of animal tests to human application without further screening in man The clinical experiment often may be performed with far greater safety after having passed through the vestibule of study with human cells in tissue culture Because therapeutic agents destined to be applied to the human skin cannot be fully understood with the exclusive use of experimental animals the evolution of methods for evaluating toxicity have been fostered Parallel technics may become available for a wide variety of test objects Wherever species specificity enters the paradigm in man s adaptation to his environment or in the diseases to which he is specifically heir, we may look with profit to the experimental situation offered by maintaining his cells under the highly controllable conditions afforded by life in vitro

SUMMARY

The study of living human cells is of great practical value Chromosomal patterns are revealed by treating cells in tissue culture with h potonic solutions Variability in chromosome counts suggests new investigations on the problem of tissue differentiation and a quest for a better classification of low grade malignancies

Cells from the nasal mucosa have been used for studies on the effect of noxious agents, drugs (especially histamine and antihistaminics) and antigens Using cinematographic records to study the rotatory activity of the nuclei of cells from the adult nasal mucosa, cells have occasionally been shown to exhibit a complete rotation in 70 seconds

Epidermal cells from skin grafting procedures have been employed in fundamental studies on the biology of the skin, the toxicity of clinically important drugs, the action of P^{32} skin-storage technic immune relations and the effect of wound healing agents

In addition to demonstrating the viability of neurons from the adult human cortex evidence regarding the dynamic role which may be played by glia in the metabolism of nervous tissue has been brought forward Membranes on the processes of astrocytes are believed to propel interstitial fluid and the clasping processes of oligodendroglia may assist in the movement of neuroplasmic substances both in the perikaryon and processes of neurons

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INTRAVASCULAR THROMBOSIS OF ELECTRIC ORIGIN[1]

PHILIP N SAWYER *Lieutenant MC USNR (2)*

JAMES W PATE *Lieutenant junior grade MC USNR (2)*

THIS study of the electric potential difference (P D) between the normal arterial wall and fresh and freeze dried arterial grafts in dogs began as part of a program to evaluate such grafts and their acceptability in the recipient host We had previously determined that freeze dried grafts were, by, all available standards, more acceptable to the host and functioned better than fresh grafts *(3)* There was, at the time, no available explanation for the statistically significant difference between the 2 types of graft

When these experiments started, little was known about the polarity and magnitude of P D across the aortic wall, there being only one recorded experiment in which the aortic wall was investigated with respect to its P D *(4)* Accordingly, a high resistance potentiometer was used with an ionic conducting system to measure the P D of the arterial walls *(5)* This system consisted of rubber tubes 5 mm in diameter filled with 0 1 N saline solution, connected at one end, by glass adapters, to small plastic electrode capillaries The plastic capillary tips were either inserted into the arterial lumen or attached to the outside of the blood vessel walls In this way the P D was measured across the wall membrane The rubber tubes, filled with saline solution, were connected at their proximal ends to a pair of identical calomel cell electrodes (fig 1) These calomel cells were then attached to the potentiometer

The first experiments were conducted on normal canine aortic walls It was found that the intima of the blood vessel is negative with respect to the adventitia in normal blood vessels The P D

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(1) Presented at the Annual Meeting of the Association of Military Surgeons 18 November 1952 Washington, D C.

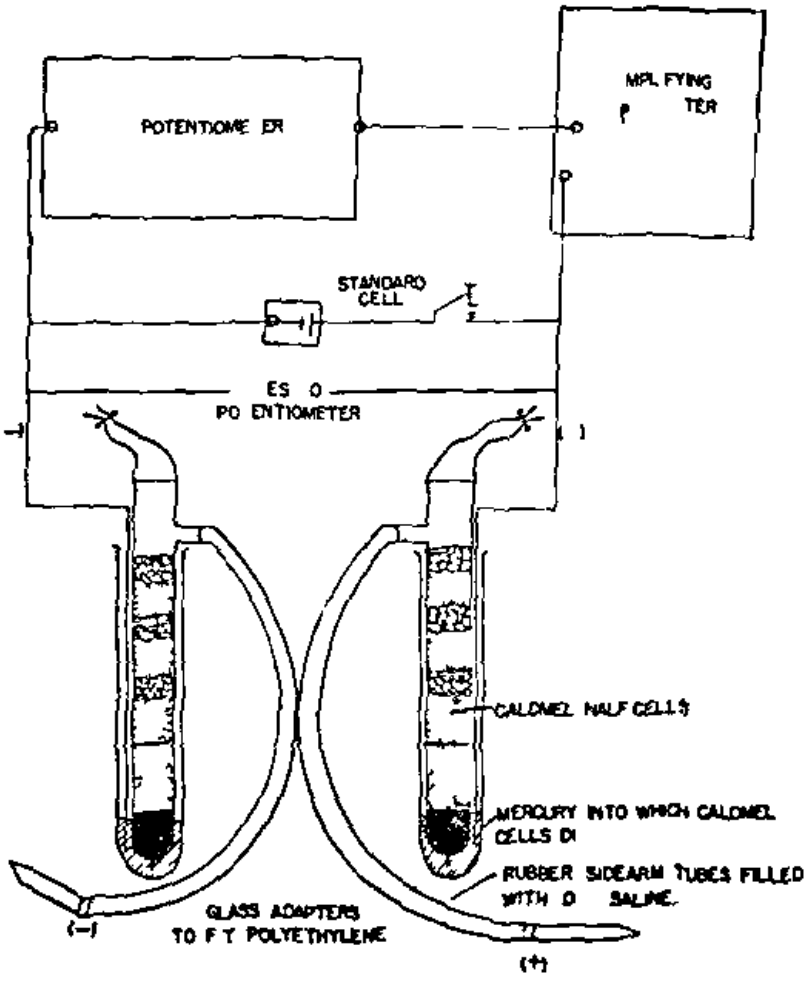
(2) The Naval Medical Research Institute National Naval Medical Center Bethesda Md

(3) Pate J W and Sawyer P N Freeze-Dried Aortic Grafts preliminary report of experimental evaluation In press

(4) Burger W E Orth O S. Nield, H W Krause R and Wickwire G C. Cause and significance of electronegativity of cut e living tissue J Lab & Clin Med 21 1162 1169 Aug 1936

(5) Sawyer P N and Pate J W Study of electric potential differences cross normal aorta and aortic grafts of dogs In press

between the 2 electrodes varied between 1 and 5 mv Next it was determined that when the aortic wall was extensively damaged or transected the potential was reversed It seemed reasonable to conclude that these positive intimal potentials were actually injury potentials because they occurred near the injured area whenever the aorta was transected or subjected to severe trauma



Figur 1 Schematic d ag am of potent ometer and the non-p larizabl calom l half c ll d to m asu e pot nt al d fference the blood ve sels.

The electric P D s of fresh grafts and freeze-dried grafts in vitro were studied Freshly removed segments of aorta displayed P D s similar to those of living transected aortas, but by 60 minutes after they had been removed from the animal all fresh aortic grafts had developed the positive intimal potential characteristic of damaged aortic tissue This positive P D reached levels as high as + 11 mv after 8 hours The freeze dried grafts on the other hand were both bioelectrically and biochemically dead tissues and had no electric P D in either direction

Early in the progress of the studios a technic was developed to measure the electric P D s of both the graft and the recipient

arterial walls into which the grafts were implanted for long pe riods It was hoped that changes in the P D of the grafts would demonstrate the rates at which endothelium grew across the grafts and the rates at which the grafts healed The hyperplastic con nective tissue growing into the grafts would be responsible for a major part of the electric P D 's which were measured in the graft area At first many difficulties were encountered in develop ing an electrode which could satisfactorily be implanted and which after implantation would be flexible enough to be run out of the dog's abdomen without causing extreme discomfort Metallic electrodes finally had to be abandoned After many trials, the same small polyethylene catheters, which we had used in the acute experiments were employed In these experiments, the external

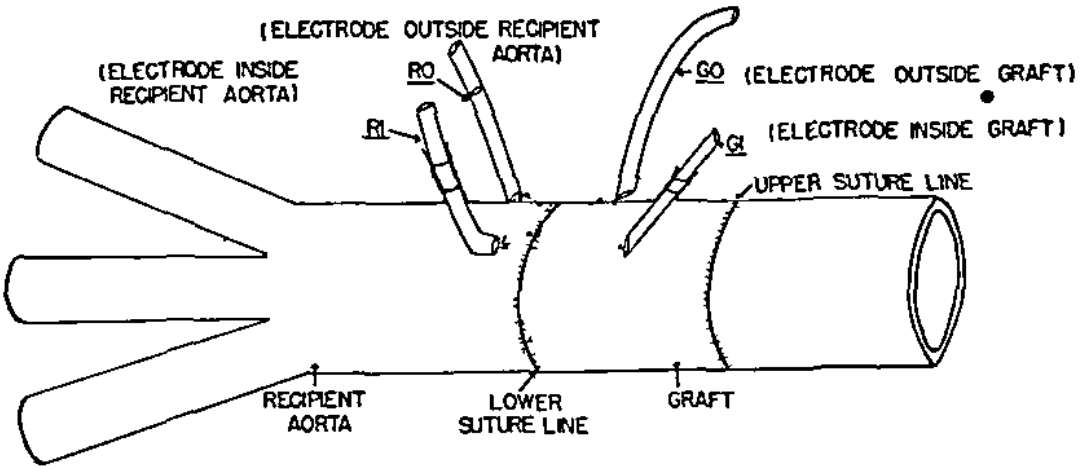


Figure 2 Recipient artery In this case the aorta is shown with the graft im planted and electrode pairs placed across the recipient and graft wall The 6 lines of dashes connecting the 4 electrodes are the 6 daily readings

electrodes were sutured to the adventitia of the aorta or the graft, the internal electrodes were inserted through a branch of the re cipient artery and the graft, and tied in place Figure 2 shows the relative position of the 4 implanted electrodes This technic worked very well because the polyethylene catheters were quite flexible The ionic electric conducting system was as satisfac tory for long range experiments as it had been for acute exper iments

To our knowledge this was one of the first satisfactory technics which had been developed for measuring the electric P D 's of tissue in vivo for long periods Six daily readings were taken Once the technic was developed, it was discovered that there were many differences in the long range P D studies between the freeze dried and fresh grafts If the sum of the daily readings comprising a complete circuit was zero or close to zero, the read ings for that group could be considered valid Figure 3 shows the

immediate spike which occurred with the freeze dried arteries Two of the 6 daily measurements are plotted on this curve The potentials around this graft and recipient artery were all in the negative direction Usually after suturing in the graft there was a rapid

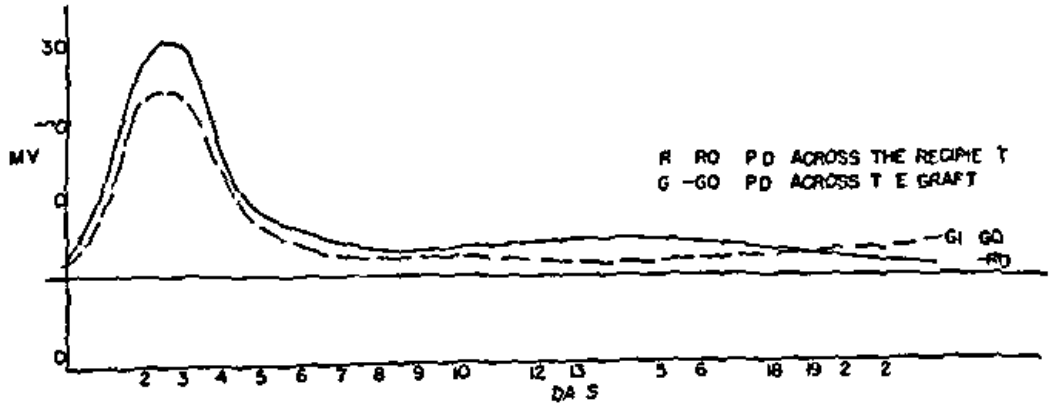


Fig 3 Schemat diag am of the m as ment of P D a oss the f ee a d g aft a d the ecip ent aorta. The mm d t p ak w th P D f ll g q kly to w th n the o mal ang ar ba acter t c.

rise in P D This P D had a magnitude of from 5 to 10 times that of the normal artery The P D reached its peak within 3 or 4 days then fell very quickly and approached a potential which was within the normal range

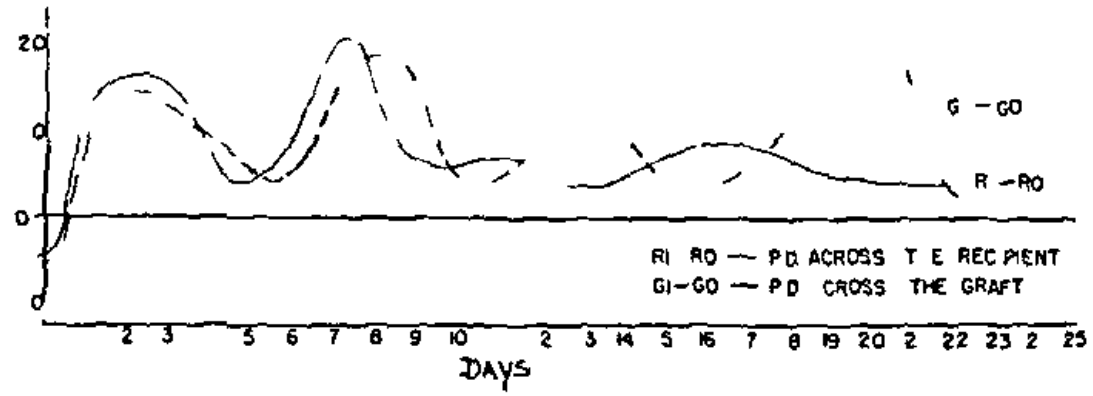


Figure 4. S hemat c diag am of the mea urements of P D acr s the f h graft and the rec p t aorta. The epe t d p ks P D a chat teri tic of f h grafts a d the ec p nt aortas.

The freeze-dried graft during and immediately after implantation was entirely passive showing only a resistance with no internal source of EMF The fresh graft on the other hand exhibited its own EMF in the P D measurement, both during and after implantation This was usually a positive P D immediately after implantation of the fresh graft. Instead of having a single immediate rise in negative potential as did the freeze-dried grafts fresh grafts in general displayed a repetitive cyclic rise in their P D s (fig 4) which was at first unexplainable It was later noted that these rises in P D occurred at periods during which maximal

host response to the living foreign homograft transplants occurs *(6–8)* These maximal antigenic responses occur at from 7 to 10 and at about 12 to 20 days, the times at which the maximal measured P D 's also occur

Normally immediately after implantation, both the fresh graft and the recipient artery displayed abnormal positive intimal injury potentials These were usually quickly reversed and became constantly negative for the remainder of the study period In 3 of the fresh grafts, however, this injury potential either never reverted to normal or became positive for relatively long periods later in their course In each of these dogs paralysis of the hind quarters was observed at from 24 to 48 hours and

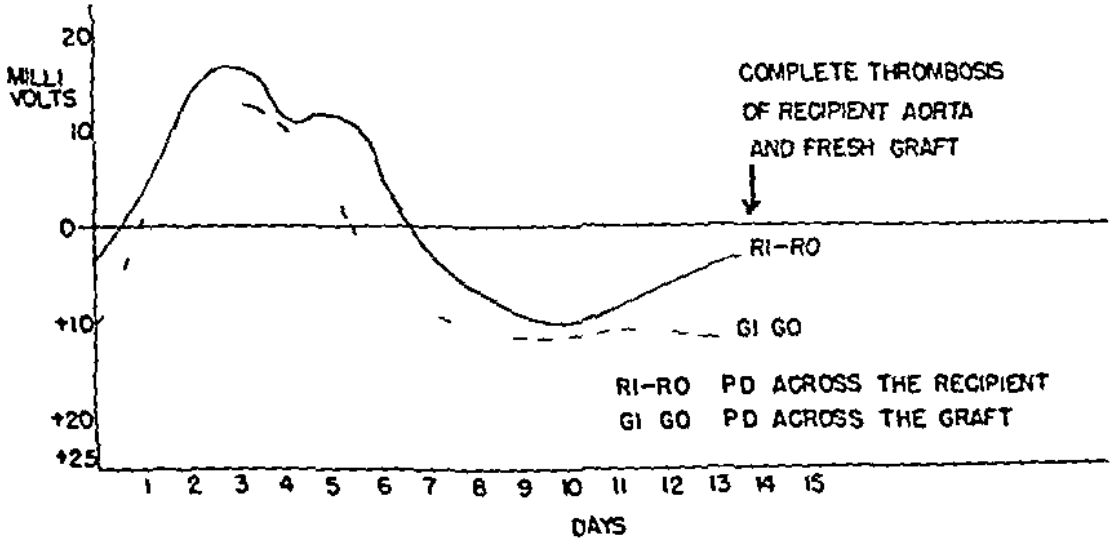


Figure 5 Schematic diagram of the P D measurements across a fresh graft and its recipient aorta. This graft thrombosed after its P D became positive

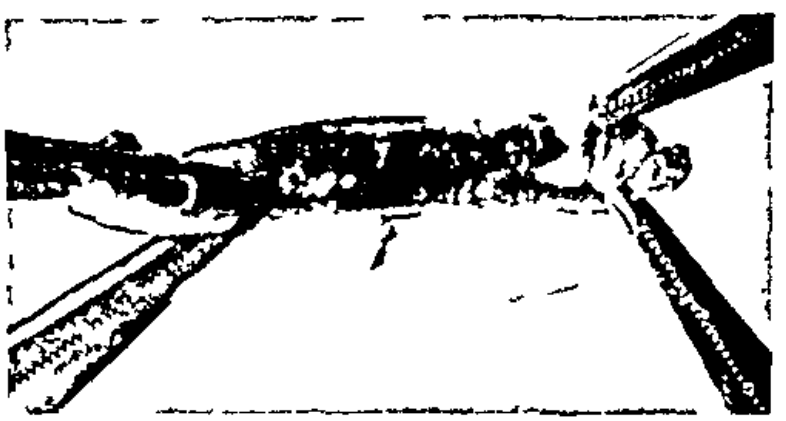
at autopsy at about 48 hours the aorta was completely thrombosed (fig 5) These positive intimal potentials, which were measured before thrombosis occurred, proved, on persistent checking of the potentials and of the measuring equipment, not to be artefacts One of the control dogs, which had a single transection of its aorta and a single pair of electrodes, implanted one inside the aorta and one outside, in order to measure the normal P D, had a fairly normal course for 2 or 3 days after its operation, but on the fifth day, its electric P D became positive On the sixth day it was + 20 mv , and by the seventh day the dog had complete paralysis of the hind quarters and aortic occlusion

(6) Allgower M. Blocker T G Jr and Ingley H W Dr Some immunological aspects of autogenous and homografts in rabbits tested by in vivo and in vitro techniques Plast & Reconstruct Surg 9 1 21 Jan 1952

(7) Longmire W P Jr and Smith S W Homologous transplantation of the new Arch Surg 62 443 454 Mar 1951

(8) Glover D M. E perimental cutaneous grafts to litter mate animal Am J Surg 83 352 358 Mar 1952

A relationship between these positive intimal potential and vascular thrombosis seemed probable Were they the cause or the result of intravascular thrombosis? Normally the red blood cells white blood cells platelets and protein components of the blood stream flowing inside a blood vessel are negatively charged at the pH of blood *(9-11)* It seems reasonable to assume that there is not sufficient electric force in the normal blood stream to deposit cellular elements on the vessel wall On the other hand the reversal of P D that occurs with injury to the vascular walls probably exerts enough force to collect cellular elements at the wall and so form a thrombus Blood cells are



Figur 6 Femoral t ry thr mb formation th un tr lat d nj d eas.

cataphoretic that is they move rapidly toward the positive pole in an electrophoretic cell It was shown next that if a platinum electrode pair separated by lucite rings is put into a test tube filled with heparinized blood and an electric current is passed between the 2 poles of the electrodes the weight of blood elements which precipitates on the positive pole of the electrode is directly proportional to the milliampere-minutes or coulombs that were passed between the 2 electrodes giving a straight line curve up to the point where there are too few cells to satisfy the current flow

To determine whether the current produced by the P D was responsible for the thrombosis an artificial P D of the same polarity as the injury potential was placed (across normal vessels) through electrodes. A thrombus invariably precipitated out only on the aortic wall beneath the positive electrode The negatively polarized wall developed no mural thrombus and

(9) Abr m H A. P bl l t nsh p betw cur t f jury nd wh blood ll infl mma Am J M Sc 167 702 710 May 1924

(10) Abr m H A I fl f low le tr mot for lectr phor f lymphocyt f differ g J E pe M d. 41 445 450 Ap 1925

(11) Ab m h A M y L S nd Go M H El tr ph f P nd th Ch mi try f C ll Surf R nh ld P bl h g C po N w Yark N Y 1942

displayed no obvious histologic changes Histologically the artificially precipitated thrombi were identical with those which occurred spontaneously Next, it was quantitatively determined by using a 3 ring guard ring that artificial injury currents of physiologic magnitude passed across the aortic wall could completely thrombose any blood vessel On the other hand, if this same current were passed in the normal direction for the same period of time the thrombosis did not occur

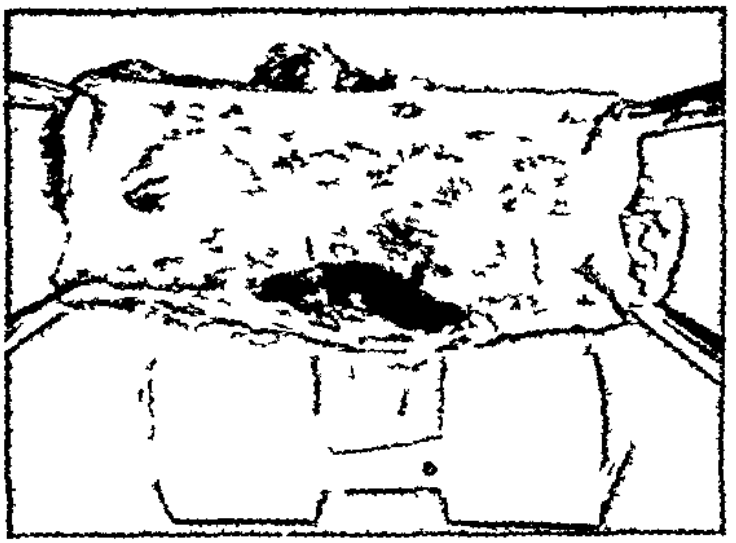


Figure 7 Thrombus formation in the uninsulated injured area (the insulator window in this vessel) Thrombus formed only in the uninsulated area.

In addition to the injury potential in the injured tissue, a flow of current analogous to volume conduction must occur between the normal and the injured segments of the vessel wall causing the precipitation of the mural thrombus in the injured tissues *(12)* If this were true and if a satisfactory technic could be developed for insulating a segment of injured blood vessel, it should be possible to prevent the precipitation of thrombi on the injured insulated vessel wall For this reason we took a polyethylene tube and fitted it securely around segments of an injured blood vessel wall Next, mineral oil was injected between it and the vascular wall to prevent electrically conducting peritoneal fluid from diffusing underneath the polyethylene The insulated areas of the blood vessel would not develop mural thrombi for a long period, but the injured uninsulated areas would very quickly thrombose (figs. 6 and 7) After from 24 to 36 hours however, the thrombus from the uninsulated injured areas would tend to propagate into the insulated areas and this proved to be a limiting factor in the protection afforded by the insulator A metal model of the insulator, which had all the physical properties of the polyethylene tube, except that it

(12) Personal discussion with Dr Martin Lamabee

was an electric conductor in no case prevented mural thrombi by any of its mechanical properties

DISCUSSION

This evidence seems to indicate that electric phenomena per se play a vitally important part in the creation of thrombi in vascular tissues Not only are the vascular tissues themselves involved in these injury potentials but the tissues surrounding the blood vessels play an important part and if severely injured contribute to the total injury P D Alexis Carrell in 1910 had discovered that if he oiled his sutures and then rubbed mineral oil an excellent and relatively innocuous insulator on both his grafts and suture lines before he closed the surgical wound the grafts did much better and had much less tendency to thrombose He did this empirically for a number of years Apparently the technic was lost after experimental arterial grafting was developed by other investigators It must, in all fairness be admitted that he was the first person electrically to insulate an aortic graft in an attempt to prevent thrombosis even though he did not understand the mechanism by which the procedure worked This phenomenon might be the missing link in the cause of intravascular thrombosis which has so long eluded discovery If it is it may contribute a good deal to the further understanding and prevention of thrombus formation in both injured and grafted blood vessels and perhaps aid our understanding of normal metabolism in vascular tissues

SUMMARY

The P D of the normal aortic wall is from 1 to 5 mv with the intima negative to the adventitia After severe injury to a blood vessel the P D reverses with the intima positive to the adventitia If this injury P D persists for long periods the vessel will thrombose If a current which is similar to an injury current is applied across the normal vessel wall using 2 external platinum electrodes a thrombus will form only on the wall under the positively polarized electrode Thrombus formation on injured blood vessel walls can be prevented for considerable periods by electrically insulating the injured segments of blood vessel with a polyethylene tube

SOME MEDICAL PROBLEMS MET IN SAUDI ARABIA

WILLIAM C MARETT *Major U S A F (MC)* (1)

THE independent kingdom of Saudi Arabia comprises about four fifths of the Arabian Peninsula which lies between Africa and Asia It is probably the hottest and driest country in the world Although comprising an area more than 4 times larger than Texas, it cannot boast a single lake or river Its population is estimated to be about 6 million, no actual census ever having been taken Aside from the concentration of population in such places as Riyadh, the king's home, Mecca and Medina, the holy cities, and Jidda, Saudi Arabia's seaport, the people for the most part live in small villages or wander about over the country in small tribes The wandering folk or Bedouins are the true classical Arabs Proud, sharp of feature, frequently poverty stricken, and often in rags, they are nonetheless aristocrats in every sense of the word They are one of the Caucasian groups known as Semites, the other big group being the Jews

The king Ibn Sa'ud, now about 72 years old, is a remarkable man Almost single handedly and with only a small band of faithful followers he, during the early part of this century, conquered many rival leaders, solidified the people, and established himself as the absolute ruler in 1926 Though blind in one eye and lame from the scars of battle, he is a handsome man and conducts himself in a regal manner He is the father of over 40 sons His eldest surviving son, the Amir Sa'ud, will succeed to the throne

From May 1948 to May 1949 I was the base surgeon at Dhahran Air Field Saudi Arabia This airfield is located in El Hasa province on the mideastern coast of the country on the Persian Gulf It lies isolated in the broiling sun, being about 2 miles from the main division of the Arabian American Oil Company, known also as Dhahran The American community at Aramco (as the Arabian American Oil Company is known) is the largest colony of American citizens outside of the United States

Dhahran Air Field functioned as a link in round the world flights of commercial as well as our own Military Air Transport Service planes All military personnel were there as guests of

(1) Brooke Army Hospital Fort Sam Houston Tex.

the Saudi Arabian government and operated in addition to the usual functions of such a station, a training school where Saudi Arabian youths were taught the various jobs necessary to maintain such an airfield When I arrived the field had been in operation a relatively short time and the facilities were somewhat limited The hospital building erected out of native stone was occupied except for a 1 room dispensary by the American Consulate as well as being used for a billet It was part of my mission to set up a 25 bed hospital in this structure During my entire stay equipment and supplies were continually coming in and it was only just as I left that this job was anywhere near completion As material arrived activities were broadened and ultimately an operating room large ward private rooms well equipped laboratory pharmacy and x ray room were in operation Before the hospital was ready to operate the facilities of the American hospital at Aramco were used for our more seriously ill patients

We had in addition to the enlisted personnel during most of the stay 2 medical officers (including myself) 1 dentist 4 nurses and 1 Medical Services Corps officer In addition to our own personnel we cared for several hundred Italian civilians who worked on the base several hundred Arab workers and the personnel of a construction company located on the base—all in all about 2 000 persons There were no dependents at first The Italians were recruited from Asmara Eritrea, Africa and flown to our base Most of them were left stranded in Africa when the fortunes of war turned against Mussolini

Although the main problem in Arabia is the intense heat, the winter months (from late November to March) on the whole, are delightful and on rare occasions during these months, the temperature may fall to the high 30 s (F) in the early morning From May through September however the thermometer averages well over 100 F with all too frequent peaks of 120 or more For days on end the temperature does not drop below 94 F —and that only at night These temperatures are all free air temperatures such as are recorded by weather observers with the thermometer shaded in a protective housing through which free air circulates The sun baking temperature" often got above 150 F On the hotter days it was literally impossible to stay outdoors for any length of time The ability to tolerate the heat varies with the humidity which varies with the wind direction When the winds came from across the desert and the air was dry existence was more tolerable than when the moisture laden winds blew in from the Persian Gulf and the dew dripped from the roofs at night giving the false impression that a long looked for rain had arrived During my stay it rained twice both times in the later part of December and each time a real cloudburst Though the country

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is arid, there is plenty of artesian water if one digs deeply enough, the depth varying directly with the distance from the coast We distilled our drinking water previous to chlorination because the mineral content made it quite unpotable otherwise

Although Saudi Arabia shows signs of awakening under the impetus of the new found oil fields, it is still a primitive country in many ways, especially regarding sanitation The average unskilled Arab laborer or coolie simply squats ad libitum when nature calls regardless of his location As a consequence, we had at all times a generous sprinkling of human feces in varying states of decomposition all over the base Nothing we did altered this to any extent Special latrines with running water in troughs were installed, but were infrequently used It might be thought that the intense heat would disinfect the feces on the open ground Actually, the outside portion was baked hard, leaving a soft, excellent culture medium in the interior Flies were abundant, but our DDT control was effective All buildings on the base, especially the kitchens and mess halls, were sprayed frequently to rid them of flies and mosquitoes

The incidence of malaria is extremely high Anopheline mosquitoes are abundant about the native wells and marshlike areas in the oases, as well as in the towns and villages Nearly 100 percent of the population has malaria at one time or another The spleen counts and percentage of infection as reported by Dr Daggi, Aramco entomologist are as high if not higher than any place else in the world, but because of (1) our location well out of range of any concentrations of infected anopheline mosquitoes, (2) our lack of close contact with native habitats, and (3) our DDT program we did not have a single case of malaria in our own men

Similarly the incidence of smallpox is high in Saudi Arabia and pockmarked faces are quite common Vaccination is spotty, reaching most of the well to do, but only a few of the poorer people Doctors are few Indian physicians are found in the larger places, but in the Saudi Arabian Army there were no medical officers Severe epidemics of smallpox were not uncommon These were generally limited to a single village, but frequently the most virulent forms evidenced themselves killing hundreds at a time One such epidemic occurred within 20 miles of our base, but none of our people had ever been to the village Nevertheless, everyone on the base (including all Arabs and Italian workers) was revaccinated and no one was allowed on or off the base without a certificate of recent vaccination Because the coolies could not be expected to keep paper chits a large mercurochrome cross was painted on the left arm, where because of the infrequency of bathing it persisted for a long time

Our biggest problem in the day to-day handling of sick call was the language barrier because we were dealing with both Arabs and Italians most of whom spoke little or no English Because of our isolation and the dearth of local medical facilities, no one who sought treatment was turned away We had an Italian interpreter and in time learned enough Arabic to get by The variety of Arabic spoken by the coolies was not difficult to learn We tried to avoid overlooking organic disease and searched carefully for objective signs The Arabs especially the coolies are highly emotional and functional complaints of all sorts are common We used placebos on many occasions to good purpose In the winter we frequently saw cases of pneumonia especially in the Bedouin children who were living out on the desert improperly protected Due to this and many other causes the infant mortality is high in Arabia Depot penicillin stood us in good stead here

Tuberculosis is common There are no sanitariums and no adequate control measures On one occasion a young officer in the Saudi Arabian Army was sent to us from Taif, the Saudi Arabian West Point We were asked to determine his fitness for duty When we saw the man we were amazed He was obviously in the last stage of some chronic and wasting disease Although he was of average height he weighed only 87 pounds His left knee was greatly swollen and partially ankylosed A roentgenogram revealed that both lungs were riddled with tuberculosis We were forced to report to the government that he was not only unfit for duty but also that he could not live much longer He was hospitalized in the Aramco Hospital and died a few weeks later Such is the need for medical care in many parts of the world

Trachoma or granular conjunctivitis is quite common in Saudi Arabia It is apparently due to a filterable virus and is mildly contagious The most frequent complications are corneal ulceration lid deformities and blindness There are many blind Arabs but more often than not, only one eye is blind Aside from spread due to the close contact with infected persons the poor nutritional status bad hygienic surroundings and the irritant action of the hot desert winds and sands were predisposing factors Because we mostly treated adults we usually saw patients with the late irreversible complications of the disease but occasionally we treated an acute case We used penicillin parenterally and locally as well as a sulfonamide ointment *(2)* Follow up was difficult but we may have helped some of these people The little girls became infected more easily because they attempted to keep cleaner than the boys and in the communal use of towels, transferred the disease from one to another

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(2) EDITOR S NOTE Th Exp t Committe Tra h ma f th W ld Heal h Org ar- on l d d t m t g G o 3 Ma h 1952 ha ur my d ra- my in w th m t ff ct dr g th r tm t f r ch m

Among the other diseases frequently encountered in Saudi Arabia are syphilis in all forms, brucellosis, intestinal parasites of all types, amebiasis, schistosomiasis, and filariasis More rarely leprosy is seen Although we diagnosed no leprosy in our dispensary, we occasionally saw Arabs in passing who undoubtedly had the disease No epidemic of typhus or cholera was seen

Our treatment of the Arabs was greatly complicated by the Moslem holy season, Ramadan This occurred at the hottest time of the year (1948) and lasted 30 days During this time the Arabs eat or drink nothing from sunup to sundown For most of them this precluded giving any kind of oral medication and the more devout even refused any parenteral therapy Frequently we gave them medicine to take at night, but if we could, we tried to persuade them to take medicine by injection if such were indicated The incidence of heat strokes and heat exhaustion increased rapidly as they continued to labor in the sun without water or food This was controlled to some extent by their habit of dampening their clothes in water As might be expected, the Arab work efficiency took a decided drop during Ramadan because they spent a good deal of the night drinking and eating in preparation for the next day, at which time there was a strong inclination to sleep Hence the ending of Ramadan was cause for celebration by the Americans as well as the Arabs

Aside from the insufferable heat in the summer, another great problem from many standpoints was the frequent occurrence of severe sandstorms The presentations of these in the movies are not exaggerated The storms came suddenly in all degrees of severity It was impossible to keep the sand out of buildings, no matter what precautions were taken The taping of windows did little good because the fine sand seemed to penetrate anything This affected not only morale but supplies and equipment It got in one's hair and clothing and was difficult to get out During the more severe of these storms, visibility actually got so low that it was not possible to see more than a few yards ahead We wore special goggles to protect our eyes from the sand, and even these did not offer complete protection The sudden appearance of these storms constituted a flying hazard and one of our planes in which I happened to be, was lost in such a storm Of the 22 persons aboard, 17 of us parachuted to safety before the plane disappeared in the Persian Gulf Following a severe storm, sand was banked about over the base much as snow after a snowstorm Often there was barely time to shovel the sand away before the next storm The air conditioning equipment, which we had in most buildings and without which we probably would not have existed, fared poorly because of the sand and was out of commission much of the time It was man against sand during most of the summer months

Saudi Arabian justice worl s under the eye for an eye and tooth for a tooth" system Chronic stealers and repeat offenders suffer the loss of a hand or a foot or both, dependin_ on the offense Usually the right hand is cut off which is particularly bad for the Arab because he is supposed to eat only with his right hand Once a person has had a hand or foot cut off his debt is paid and he is bothered no more The guillotine amputations are per formed with large knives and are accomplished with one sv ing of the blade right at the wrist in the case of the hand with no bone damage Formerly the stump was dipped in hot oil and quite frequently the victim crawled off into the desert to bleed to death or die of infection Now the Saudi Arabian authorities allow an oil company aid man to be present As soon as the hand is cut off a tourniquet is applied morphine is administered and the culprit is taken to the hospital where a general anesthetic is administered and a good stump is fashioned This necessitates rongeuring away some bone to get a good flap I was present for several of these and never saw one of these victims display any emotion or utter a sound throughout the whole ordeal Once re-leased from the hospital they disappear and are never seen again A one-handed Arab is never seen because most of them flee to India where they beg for an existence This system of justice eliminates the maintenance of prisons A man is kept in jail only until he is tried then he is either fined suffers the loss of one or more of his members loses his head or is set free

All of the fresh vegetables consumed at our base were pur chased in Asmara Eritrea on the east coast of Africa across the Red Sea from Arabia over 1 000 miles away They were flown in regularly by our planes The few vegetables and melons avail able in Arabia were raised in irrigated gardens under such in sanitary conditions that we could not hazard their use even though we took every precaution possible in preparing them As it was we were never too sure of the mode of fertilization and handling although we visited the supposed farms of origin in Africa All our meats and milk were shipped frozen in refrigerator boats from the United States This worked well until on one occasion our refrigeration storage system brol e down On occasions like this when no veterinarian is present, the medical officer is called on to decide whether or not the meat is fit for consumption This can be quite a problem On this particular occasion it was de cided that most of the meat was edible even though it was al tered somewhat in taste and consistency

The biggest problem regarding our own men was primarily one of mental health The intense heat the isolation meager recrea tional facilities and lack of dependents all had their effect, dependin_ on the degree of adaptability Althou_h the tour was

justifiably set at 1 year, no person was rotated until his replacement had arrived There were many delays and these had a bad effect on morale All in all, there was a tendency for the men to drink more than ordinarily, although we did not have too much trouble with alcoholism per se We had our share of functional complaints and a few frank psychoses Our next echelon of medical evacuation was a general hospital in Germany This gave rise to the problem of those men who wanted to go to Germany to be hospitalized for one condition or another It can well be imagined that a nice stay in a general hospital in Germany was a desirable change from the conditions in Arabia Every effort was made to improve the recreational facilities and close cooperation was required of the medical personnel, chaplains, and command personnel Among other things, a deep-sea fishing boat, which also doubled as a crash boat, was outfitted This helped appreciably We had a swimming pool of sorts which kept filling with sand This was ultimately renovated and made more serviceable Most of the recreational facilities of Aramco were open to us but there was the problem of transportation We also had an open air movie theater that operated several nights a week. This was used to the maximum—almost everyone saw all the films More recently the recreational facilities have been improved many fold

Venereal disease in Saudi Arabia proper was no problem because prostitution does not exist. Our men had no contact with the local women The native women are kept in seclusion for the most part, and when seen are shrouded in long, black dresses and heavily veiled, the entire face being covered with sort of leatherlike masks Some cases in our men were, however, contracted from Indian prostitutes on Bahrein Island, which is located about 25 miles out in the Persian Gulf We had planes going there almost every day and men were allowed to visit on pass Bahrein Island is an independent sheikdom under a sort of British mandate and is the site of Bapco (British Arabian Petroleum Company) The city of Manama on Bahrein Island is quite large and served as a local shopping place for American personnel The prostitutes there were almost 100 percent infected with one or more venereal diseases Our incidence of infection from this source would probably have been much higher had the town been more readily accessible

During the few cooler winter weeks our incidence of upper respiratory diseases was increased This was especially true during the times of transition, such as early winter and early spring when the days were hot and the nights cool After suffering with the heat for so long there is a tendency for Americans not to clothe themselves properly when cooler weather arrives During most of the time, short sleeved shirts and shorts were worn Open

toed sandals that allowed the sand to get out were popular and allowed Experimental uniforms were sent to us for trial These consisted of pith helmets loose fitting short-sleeved bu h jackets patterned after the British shorts and especially de signed open toed strap sandals These worked well in general but most of the men preferred instead of the bush jacket a standard khaki shirt with the sleeves cut off Most of the time dark glasses were worn by everyone while outside

Another medical problem was the equipping and organizin of our portion of a desert crash team that could go out on the desert for prolonged periods in the event of crashes away from the base as well as in connection with other emergencies From our first trip into the interior 110 miles away to the site of a plane crash we learned much This particular tragedy resulted in the death of 11 of 12 men and when we arrived on the scene 3 days later the problem of handling these bodies that had been out in the sun for that length of time might be imagined Navi gating in the desert is pretty much like navigating in the sea and in spite of the presence of experienced guides furnished by the oil company we got lost several times On one occasion for over 12 hours half of the party got lost from the other half which had all the food except for a few chocolate bars not a particularly palatable food in the desert heat. This was in May and the temperature was 140 F in the sun It was necessary to use special cars with oversized tires and oversized radiators In spite of this there was frequent bo ging down in the sand and all too often boiling radiators We had no trouble getting people to take salt tablets after they saw 1 or 2 cases of heat exhaus tion *Desert rescue and travel is a problem in itself and we finally* paid more attention to the Arabs who had been at it for several centuries This resulted in more frequent use of native headdress and awareness of the fact that only "mad do s and Engli hmen go out in the noonday sun

THE PROBLEM OF BURNS IN DISASTER[1]

CURTIS ARTZ *Major MC U S A (2)*
ERIC REISS *Captain MC U S A (2)*
JOHN H DAVIS *Captain MC U S A (2)*
WILLIAM H AMSPACHER *Colonel MC U S A (2)*

RECENT developments in atomic weapons have stimulated a renewed interest in the problem of thermal burns Observations of the survivors of the atomic explosions at Hiroshima and Nagasaki indicate that over 50 percent of the casualties were due to thermal burns The threat of atomic bombing of American cities and the use of atomic weapons in combat emphasize the need for planning methods of treating large numbers of burn patients in the event of a future war Medical care in such catastrophes must be primarily concerned with the saving of the largest number of lives and the rapid return of the injured to useful work by the simplest means Leaders in the field of surgical research have recognized that thousands of burn casualties may be expected and have stimulated several military and civilian centers to study the burn problem *(3)*

This article will (1) present briefly the results of investigations in the early management of the burn patient, (2) propose a general outline for the triage and care of burns in disaster, and (3) suggest methods of disseminating information on the treatment of large numbers of burn casualties to the medical student and to civilian and military physicians

In the past several years many medical schools have carried out extensive studies on thermal injury under contract with The Medical Research and Development Board, Office of the Surgeon General U S Army For the past 3 years the Surgical Research Unit at this hospital has been studying several facets of the problem Several important developments in burn care have evolved from these investigations Three of these developments,

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(1) Presented to the Joint Subcommittees on Teaching of National Defense Medicine of the Emergency Medical Service Section of the American Medical Association and the Association of American Medical Colleges on 3 April 1952 Washington D C.

(2) Surgical Research Unit Brooke Army Hospital Fort Sam Houston Texas

(3) Great credit should be given the Medical Research and Development Board Office of Surgeon General U S Army for leadership in organizing and promoting research on thermal and radiation injury

of critical importance are (1) the management of burn shock (2) initial local care of the thermal wound and (3) air transportation of burn casualties

BURN SHOCK

The prognosis and amount of replacement solutions required depend to a large extent on the amount of body surface burned A rapid estimation of percentage of burn may be obtained with the so called rule of nines which divides the body into areas representing 9 or multiples of 9 percent of the body surface *(4)* as shown in table 1 After determination of the extent of the body surface burned the physician can anticipate the fluid loss and estimate the amount and type of replacement therapy

TABLE 1 *R l /*

A	P t
He d	9
Uppe tr mity (ea h)	9
A r tru k	18
P t tr k	18
L w r tr m ty (e h)	18
Pe um	1

Purnell and Evans *(6)* have proposed a formula for estimating the amount of fluids required in the treatment of burn shock Although formulas are not foolproof they serve as useful guides for treatment and this formula has yielded excellent results in extensive clinical trial It is based on the weight of the patient and the percent of body surface injured In the first 24 hours after burning the patient requires 1 cc of colloid solutions per kilogram of body weight for every percent of body surface burned and an equal amount of electrolyte solution In addition from 2 000 to 3 000 cc of water not containing electrolytes are required to replace insensible water loss (table 2) An adult weighing 70 kilograms with 30 percent of his body surface burned would thus need about 2 100 cc of colloids 2 100 cc of electrolyte solution and 2 000 cc of water in the first 24 hours The fluid requirements if the burned surface is greater than 50 percent should be estimated on the basis of a burn of

(4) P l k E J Art C P Sh ff J R H kab W E M h ll R C d R ll J P E po ur (p) tr tm f bur U S Arm d F M J 2 769-776 May 1951

(5) Pur ll O J d E E I Fluid d l tr lyt q m bur I Sympo um Bur N nal A d my f S N nal R h Counc l W h gt D C 1951

50 percent of the body surface No patient should receive over 10,000 cc of fluid in the first 24 hours To keep pace with the expansion of the extracellular fluid, one half the total estimated requirements of the first 24 hours should be given in the first 8 hours after injury, one-quarter in the subsequent 8 hours, and one-quarter in the last 8 hours

TABLE 2 *Fluid requirements for first 24 hours*

Colloid solutions (blood plasma plasma expanders)	1 cc per kilo for each percent burn	
Electrolytes (saline solution or 1/3 sodium bicarbonate plus saline solution)	1 cc per kilo for each percent burn	
Dextrose in water *(obligatory demand)*	2 000 cc	
Calculate burn of more than one-half the body surface as 50 percent	Rate	1/2 in first 8 hr 1/4 in second 8 hr 1/4 in third 8 hr

Urinary output — 30 to 60 cc per hour for second 24 hours
One-half colloid and electrolyte requirements of first 24 hours

During the second 24 hour period, the colloid and electrolyte requirements are roughly one half the recommended amounts for the first 24 hours After 48 hours, fluid should be supplied mainly by mouth Colloid solutions should be given in the form of whole blood, plasma, or one of the plasma expanders Electrolyte requirements may be satisfactorily met by isotonic saline or lactated Ringer s solution

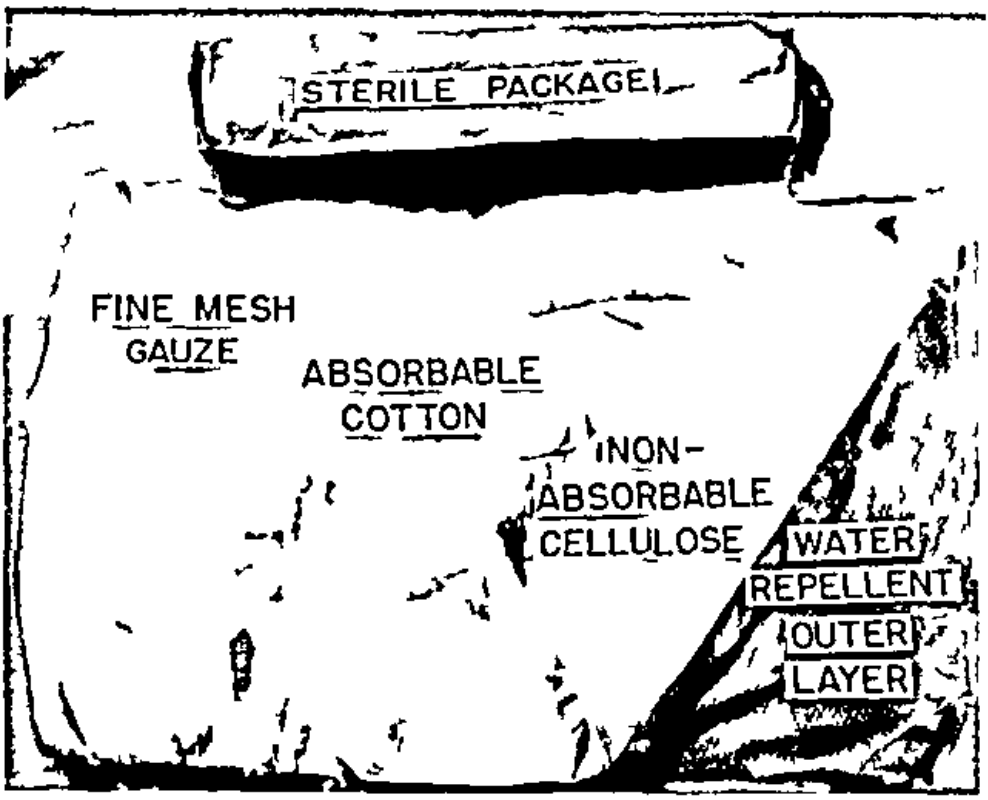
Although the above formula permits the physician to *estimate* the amount of fluid replacement therapy, the rate of urine excretion is the most important single index in appraising the adequacy of treatment An hourly urine output of from 30 to 60 cc is satisfactory If it falls below 30 cc per hour, the rate of fluid administration should be increased, and if it rises above 100 cc. per hour, fluid administration should be diminished The above formula is easily taught and serves as an excellent guide to therapy, especially for those without extensive experience in the management of burn shock

LOCAL CARE

In the past 10 years, the local care of burns with pressure and occlusive dressings, as introduced by Allen and Koch *(6)*, has been almost universally accepted by the medical profession,

(6) Allen H S and Koch S L Treatment of patients with severe burns Surg Gynec & Obst 74 914-924 May 1942

but under disaster conditions adequate supplies and personnel will not be available for the proper application of these dressings In 1949 Wallace *(7)* reintroduced the exposure treatment. Since then several burn centers including our own have had excellent opportunities to evaluate these methods of local care Two developments are significant A one-piece emergency dressing has been developed and it has been found that exposure treatment is feasible and practicable in selected patients



Figur 1 U er al prot ctiv dr g

Initial local care must be delayed until adequate shock therapy is assured The burn wound should be gently cleansed with a bland white soap All blisters should be broken debris removed and detached epithelium cut away No local applications of any sort should be used Systemic penicillin should be given for at least 5 days

The universal protective emergency dressing developed under the auspices of the Subcommittee on Burns of the National Research Council is produced in two sizes 22 by 36 inches and 22 by 18 inches *(8)* It is packed with 2 rolls of semielastic cotton conforming bandage with a sterile brown paper covering (fig 1) This dressing is now being procured for use by the

(7) W ll A B T m t f bur A Roy Coll Surg E gla d 5 283 300 N 1949

(8) E E I Ea ly m g m f ly bur d pa t. Surg Gy & Ob 94 273 282 Ma 1952

Armed Forces The inner surface of the dressing is dry, fine-mesh gauze The intermediate layer is composed of a 1 inch layer of absorbent cotton and many layers of absorbent cellulose The last 6 layers of the cellulose are water repellent. A simple, water repellent, cotton fabric serves as an outer layer The dressing, which has an excellent absorptive capacity and may remain in place for as long as 10 days, can be quickly and effectively applied by a relatively untrained person

EXPOSURE TREATMENT

In 1949, our unit became interested in the exposure treatment of burns It seemed to offer an approach to the management of large numbers of casualties Our aim has been to learn rapidly the feasibility and the limitations of this method Drying of the exudate of partial thickness burns can be observed from 12 to 24 hours after exposure to the air A hard, dry, adherent crust forms in from 48 to 72 hours and serves as a protective covering for the wound As healing of the burn proceeds, the crust desquamates spontaneously, leaving a well healed surface Desquamation in the more superficial areas occurs in from 7 to 14 days, and in deep, partial thickness burns in from 14 to 28 days

After 72 hours of exposure, the injured dermis of the full thickness burn dehydrates, contracts, and becomes a dry, dark brown eschar which serves as a physiologic dressing for the wound After from 10 to 20 days the eschar is removed surgically and the underlying surface is ready for grafting

In the past 3 years, 250 patients have been treated by this method at Brooke Army Hospital and Tokyo Army Hospital Of 230 partial thickness burn areas, 52 were located on the face and healed in an average of 10 5 days after exposure, 64 were on the hands and healed in 17 days, 37 were on the upper extremities and healed in 16 days, 46 were on the lower extremities and healed in 19 days and 31 were on the trunk and healed in 16 days The average healing time of all partial thickness burns was 16 days Full thickness burns of from 1 to 22 percent of the body surface were associated with partial-thickness skin loss in about one-half of the patients It was difficult to analyze the exact time when these areas were ready for grafting The general condition of the patient, the state of healing of adjacent partial thickness burns, and in some cases, the presence of infection, influence the time for grafting In general, it was noted that the full thickness burn eschar could be removed and the area was ready for grafting at the time when epithelization of the surrounding partial thickness injury was complete In many instances, the full thickness area was excised and grafted before desquamation of the surrounding partial thickness injury on the

eighth or tenth day after injury It was our impression that ex posure did not in any way delay grafting

In 77 percent of the patients, there was no evidence of infection in the thermal wound at any time Minimal infection in some portions of the burned area was detected in 17 percent of the patients This type of infection was evidenced by small amounts of purulent material which developed in cracks in the crust Frank suppuration was seen in 6 percent of the patients *(9)* In these, infections spread progressively over the burned area, undermining the crust and necessitating its removal

Advantages of exposure The outstanding feature of exposure is the effective control of infection Suppuration is uncommon and the unpleasant odor usually associated with infection in burns is absent. Elimination of infection reduces conversion of partial to full thickness skin loss Deep dermal burns heal spontaneously under cover of a good crust and the need for grafting of such areas is definitely lessened Exposure treatment can be rapidly accomplished with minimal effort. It is easily taught requires a minimum of professional man hours and elim inates the need of facilities for elaborate aseptic technic Ex pensive bulky dressings are unnecessary These advantages are very important in preparation for a disaster when adequate supplies and facilities for the proper applications of dressings probably would not be available

Disadvantages of exposure The most significant objection to the method is that unlike treatment by dressings, it is not universally applicable to all patients under all conditions It is contraindicated in circumferential burns of the trunk, other burns in which all areas of the injured surface cannot be properly exposed and in burns with coexisting soft tissue wounds In general the positioning and placing at rest of the burned area is not difficult, but injuries of certain configurations may pose serious problems At times maintenance of a good position is uncomfortable for the patient In elderly patients and in some children it is difficult to obtain the necessary co operation to protect the crust from mechanical trauma In the first 48 hours patients may experience some pain and a sensation of cold prior to the formation of a crust but this is rarely severe

We prefer the exposure method of local care for all burns whose configuration permits complete exposure without undue difficulty or discomfort. By these standards many burns are suitable for

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(9) P l k E J Ar C P R E Da J H d H kab W E E lua f po ur m b d atm t f bur I Surg I F rum P d g f h Fo m S Thirty Sev th Cl I C gr f th Amer C ll g f S g Sa F c Cal f. Nov 1951 W S Saund C Ph l d lph P 1952 pp 518 523

treatment by exposure In some patients when exposure is contraindicated, occlusive dressings must be applied Since minor burns heal well, irrespective of the type of local care, exposure is not recommended in ambulatory outpatients because it limits their activity If several areas of the body are involved, the distribution may be such that it is advisable to expose some sites and dress others It must be emphasized that after a full thickness burn has progressed to a granulating surface, it becomes unsuitable for treatment by exposure

AIR TRANSPORTATION

In the past few months, 10 severely and acutely burned patients were evacuated under the direction of one of our medical officers to this hospital from distances of from 300 to 1,400 miles *(10)* Burn shock *must* be controlled before transportation is attempted Air evacuation of extensively burned patients treated by exposure is feasible even in cold weather, but it is more difficult and less comfortable for the patient than if dressings are used Exposed burns of the hands and face can be transported with ease If exposure is indicated, dressings may be removed on arrival at a fixed installation

TRIAGE OF BURNS

Although it is impossible to define completely the triage and care of burn patients in catastrophe and combat, existing knowledge gained from experiences in the Korean campaign and from the results of several investigative studies in different burn centers makes possible a brief general outline of disaster care (tables 3 and 4) Casualties may be divided into 4 groups closely corresponding to the division of wounded patients in the evacuation technic of the Medical Service, U S Army

First priority patients include all those threatened with shock, due either to burns involving more than 20 percent of the body surface, or to complicating injuries An emergency dressing should cover the injury and the patient should be evacuated as expeditiously as possible to the nearest emergency surgical unit for shock therapy As soon as the patient's condition permits, the burn wound should be cleansed, all devitalized tissue removed, and a definitive dressing applied If the burn is suitable for exposure, it may be treated by this method. As soon as the patient's condition is stabilized (3 to 10 days) evacuation to to a burn center should be accomplished

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(10) Artz C P R s E and Amspacher W H Clinical investigation in burns In Symposium on Treatment of Trauma in the Armed Forces Army Medical Service Graduate School Walter Reed Army Medical Center Washington D C 1952

234800 O 52 4

TABLE 3 *Triag / bu s*

P to ty fo tr atme t	Cr t i
1	Pat nts th atened w th h k be u f B f ove 20 p t of th b dy urf c b. Compli at g nj e
2	N mbul t ry p t n w th bu f l s th 20 p cent of th body rf c
3	Amb l to y p t t w th m b s th q re ob v ti n
4	P t ts who c e f t th w b

Second priority patients include those who are nonambulatory who have less than 20 percent of the body surface burned After the application of an emergency dressing these patients should be sent to an evacuation type unit to the rear of the emergency surgical unit. Because the patient will not require shock therapy he can be transported by the most expeditious means On arrival at the evacuation installation the burned areas should receive initial local cleansing and debridement and then be exposed or redressed Evacuation to a burn center should be accomplished in from 1 to 5 days

TABLE 4 *D a t ca*

P o ty f t tre tm t	Eme g cy t	Later c
1	a Eme g cy d e st g b S d t m ge cy surg cal un t Sh k th e py	d Cl e—d s o e p e I 3—10 d y nd t b c e t
2	Eme g cy d es g b S nd t a at type unit	Cl — xpo d s d In 1—5 day d t b m e t
3	Send t ation typ n t	b. Clea — e p
4	a Cl nse pply light d s ng	

Cr t h w i table 3

Walking burn patients will require observation until healin is nearly complete They should be sent to an evacuation type unit where careful cleansing can oe accomplished If the con

figuration of the burned areas are such that exposure is practicable, this type of treatment should be used

Self care burn patients need be seen only once The burned area should be cleansed with soap and water and a light dressing applied Although exposure is possible in this type of patient, it is believed that the patient can carry on his daily activities best if a small dressing is applied to the injured area to protect it from mechanical trauma

EXTENSION OF MEDICAL EDUCATION IN CARE OF BURN CASUALTIES

With the increasing emphasis on burn care in the Armed Forces and in civil defense it would seem that there is a need for increased emphasis on this subject in medical education The average medical student and civilian physician have an opportunity to see only a few severely burned patients Because a large percent of our graduating students are entering the Armed Forces, a plea is made for the expansion of the subject of burns in the curriculum of medical schools Because the threat of mass burn casualties involves all the physicians in our nation, it would seem wise to emphasize burn management at scientific medical meetings Various national and state medical societies should include a panel on the treatment of burns at their annual meetings These presentations would stimulate every physician's interest in the care of the burn patient

SUMMARY

Recent international events and the increased emphasis on the use of atomic weapons have made a renewed interest in the management of burns mandatory Several significant contributions to burn care have been made by various civilian and military centers

The treatment of burn shock should take precedence over local care Although a rough guide to fluid replacement can be determined from the weight of the patient and extent of body surface burned, the treatment of shock depends on close clinical observation of the patient and his urinary output during therapy

The local care of burns can be accomplished by the application of dry, fine mesh gauze dressings or by exposure to the air A new, one piece, universal protective dressing has been found very useful in the emergency treatment of burns

Experience with the exposure method in over 250 patients has shown that it is a practicable method of local care The average healing time of partial thickness burns was 16 days 77 percent of the areas healed without infection Full thickness burns were ready for grafting at the time the surrounding partial

thickness areas were healed. In the event of a large scale catastrophe, the simplicity of the method may make it the most practicable *method of treatment* Its chief disadvantage lies in the fact that it is not applicable to all patients under all circumstances

In the triage and disaster care of burn patients those requiring shock therapy should be evacuated immediately to an emergency surgical unit.

Increased emphasis must be placed on the *training of physicians* in the management of burn casualties

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BOOK REVIEW

Pre cr ptio for Reb llio by *R b t L nd* 305 p g Ri h rt & C I N w Yo k N Y p bl he 1952 Pr c $3 50

Although this book was v ritten for laymen unless the readers are well versed in modern psychologic theories and psychiatry and well acquainted with the various figures in the field they will be hopelessly confused The book is not easy reading Lindner attacks present-day psychiatry and psychology on the basis that these disciplines are dedicated to the proposition that the best way of life is the way of adjustment and conformity thus reducing their patients to the status of mass men Mass men according to the author are produced by society through the operation of religion current academic teachings psychiatry *et cetera to be the meek and unprotesting tools of their* masters Unless this state of affairs is changed he predicts the destruction of civilization and perhaps of the human species He draws a parallel between our present state and that of other civilizations that have perished

He postulates an instinct for rebellion which he believes must be nurtured in order that we may avoid a similar fate He is not entirely clear as to how this should be done, or whether it is entirely possible but he believes that only by producing a number of informed rebels may society eventually be saved. The book presents an interesting and provocative thesis and is well worth the reading, but Lindner s attack on modern psy chiatry and psychology seem unduly bitter and biased Certainly the book would give the layman a distorted viewpoint.

—Lt Col J F Tuttle MC USA

IATROGENIC DISEASE IN SOLDIERS[1]

HENRY A SEGAL *Major MC U S A* [2]

AT times our efforts to practice scientific medicine cause us to lose sight of the patient as a person We tend instead to view him as a biophysical and biochemical unit suffering from this or that dysfunction which must be diagnosed and then cured The art of medicine is rapidly becoming lost and, although its existence is acknowledged, it has neither been clearly formulated nor has it for the most part been included as a part of the medical curriculum The young medical graduate of today is expected to acquire his knowledge of this art primarily through trial and error Despite vastly increased stores of medical knowledge and refined diagnostic tests and technics, far too many "well" patients are rendered sick and too many sick patients sicker as the result of their physician's faulty medical management For the purpose of this discussion the term "iatrogenic" is applied to any disorder induced, intensified, or prolonged in the patient as a result of the physician s examination attitude, treatment, or disposition of the patient

Iatrogenic disease is held to be more prevalent among soldiers than civilians and most common in soldiers either in a combat zone or faced with the possibility of soon serving in such a zone Factors operative in both the patient and the medical officer serve to explain its high incidence To understand iatrogenic disease among soldiers it is first important to view those factors which render them susceptible to the development of this disorder and then to appreciate how the medical officer's examination, treatment, manner, and disposition of the patient may tend to induce this condition

The American soldier does not engage in combat because he enjoys the threat of injury or death Months of training are spent in preparing him for combat Ultimately he maintains himself in combat primarily because of his intense identification with and regard for his buddy" and his company or platoon If he is reasonably well motivated and has any conscience at all he cannot risk letting his buddy down, but injury or disease provides

(1) Presented at the Hokkaido Medical Conference Sapporo Hokkaido Japan 16 May 1953

(2) U S Army Hospital 8167th Army Unit

him with an honorable release from combat In the hospital a may cling to his old symptoms or develop new ones either consciously or unconsciously in an effort to perpetuate the gain which resulted from his illness or injury It is as if he were *attempting to prove both to himself and to* others that his is an honorable disability and not a deliberate attempt to evade hazardous duty His most frequent symptoms are headache backache weakness rapid heart rate poor hearing poor vision inability to concentrate and exaggerated complaints referable to the area of nondisabling abnormality

It is imperative that these complaints be dealt with in a firm and objective manner Unnecessary tests and consultations prolong the patient s stay in the hospital and tend to fix the symptoms rather than to erase them One must not make the error of equating complaints with disability for to do so is to firmly entrench in the patient s mind the idea that he really has some thing wrong" which prevents his performing useful military service

RESPONSE TO ANXIETY

The soldier in combat or faced with combat suffers from anxiety Symptoms such as tachycardia mild dyspnea nausea insomnia urinary frequency fatigability tension and tremulousness are seen To regard these symptoms *as though* they were indications of disease rather than the normal physiologic visceral response to anxiety is to risk rendering the patient an iatrogenic psychiatric casualty The anxious oldier is extremely suggestible and to a degree experiences feelings of guilt about his anxiety I e is worried about not being able to measure up to what his unit his buddies and he himself expect of him If hospitalized because of mild anxiety symptoms he may seize on this fact to assuage his guilt saying, I m too sicl to fight " i e to measure up

Case 1 A 19 year old soldier was admitted to his unit battalion aid station in Korea after 2 weeks of combat complaining of palpitation tachycardia substernal oppression and anxiety Physical examination was negative except for a functional heart murmur He was evacuated to Japan with the diagnosis Observation medical to rule out organic heart disease

The patient stated that he had been nervous all his life When called on to recite in the classroom he would experience palpitation tachycardia anxiety chest pains and dizziness When subjected to emotional stress he would react in similar fashion He volunteered for the Army because he believed he would oon be drafted At the time of the induction physical examination he was told that he had a functional heart murmur which was not incapacitating and was given an explanation of the mechanics of

the murmur which apparently enabled him to disregard it During basic training he experienced several attacks of acute anxiety and was seen by a psychiatrist who assured him that the attacks were not harmful and that he had no heart disease Laboratory studies including an ECG were completely negative Physical examination was negative with the exception of a murmur which was clearly functional

In the first week of hospitalization the patient experienced no attacks of anxiety When informed that he was to be discharged to duty, he became tense and had an attack of tachycardia which was relieved by pressure on the eyeballs He then developed nausea, occasional vomiting, and insomnia as well as many somatic complaints and was referred to the psychiatrist for consultation The patient stated that he was extremely worried about his heart because both his parents had died of heart disease He believed that he, too, was suffering from heart disease and that the doctors had failed to recognize it He said, The doctor in Korea told me that he wasn't sure whether I had heart disease or not and that he was sending me to Japan for tests and studies I know that I must have heart disease and they should never have taken me into the Army "

Comment Failure to recognize the visceral response to anxiety and an indecisive statement regarding this soldier s heart rendered him a cardiac invalid In the past when his complaints were properly managed he was able to render satisfactory duty It is significant that the physician evacuated him to Japan despite the fact that facilities in Korea were adequate for cardiac study

SOMATIZATION REACTION

A patient with a somatization reaction presents a more difficult problem from the standpoint of recognition and treatment Here the anxiety is not perceived as such by the patient Instead, it is channeled into the viscera and results in functional disease with its associated complaints A careful history and physical examination should suffice to convince the medical officer that the patient does not suffer from organic disease If, however, the physician treats the condition *as though* it were a true organic disease he disregards the etiology of the condition and causes the patient to "fix" upon his symptoms Thus, the basic personality disorder escapes unnoticed and the patient s anxiety is fixed at a somatic level He grows increasingly more demanding and more and more tests, studies, and consultations are required Eventually, he is convinced that he suffers from a serious and obviously incurable disease and no amount of subsequent reassurance can convince him to the contrary He may even demand retirement because of "incapacitating disease " The proper treat

ment of such a patient necessitates facing him as soon as possible with the fact that he suffers from no serious organic disease that his symptoms and signs are the results of an emotional illness and that no further hospitalization studies consultations or tests are indicated In this way the foundation is laid for subsequent psychotherapy which requires at its outset that the patient at least recognize the possibility that his disorder is the result of emotional tension rather than a true organic disease

The mismanagement of psychogenic syndromes gives rise to the greatest proportion of patients with iatrogenic disease Most prevalent among military personnel are iatrogenic heart disease and iatrogenic back disease Oille *(3)* in reporting on iatrogenic heart disease states that 60 percent of the patients who consult a cardiologist in civil life are suffering from an exaggerated and wholly unnecessary anxiety about their hearts arising from suggestion and not based on reason Most of the suggestion emanates *from careless or ill considered remarks made by physicians* It must be borne in mind that few persons are more suggestible than those who are anxious, regardless of cause Any doubt any uncertainty is readily perceived by them and causes them immediately to lose faith and to develop further symptoms Here the attitude of the physician is all important It does not do at all for the examining physician to spend 20 minutes auscultating the heart and to then assure the patient that there is nothing wrong with his heart The patient knows that doctors do not ordinarily listen to a heart for that long a period and deduces that he must therefore have some serious lesion of the heart which the physician is concealing from him Nor is it helpful for the doctor to tell the patient that he is suffering from functional heart disease or pseudoangina" or psychoneurosis To the patient these terms imply disease and convince him that he is really ill One must pause long enough to tell the patient the meaning of the findings and to indicate clearly the difference between functional and organic lesions

Iatrogenic back disease appears to be the most prevalent iatrogenic condition seen in soldiers in this Theater Such conditions are the direct result of the physician s errors of omission and commission The following case report clearly shows how such a disease may be produced

Case 2 A 21 year old soldier with 12 months of active service was admitted to the hospital as a transfer from another Army hospital in Japan with a diagnosis of sprain chronic lumbosacral associated with sacralization of the transverse process of the sixth lumbar vertebra He was in excellent health until while

(3) O ll J A Ca d ur Canad M A J 45 1 7 J ly 1941

taking basic training he awakened one morning with low back pain He was seen on sick call, told that there was nothing wrong, and given a bedboard, rest, massage, and heat treatments which afforded some relief of symptoms He completed basic training and was sent to the Far East Command arriving in July 1951 He reported on sick call in Korea because of back pain and was seen by a medical officer who found nothing wrong in his back. He was given no treatment and promptly returned to duty where he managed to get along okay " In December he was rotated with his division to Japan and began to experience frequent attacks of low back pain and was seen frequently on sick call He was given heat, massage, and a bedboard without amelioration of his pain He was hospitalized for work up in February 1952

Physical examination revealed slight limitation of motion of his spine but whether voluntary or from disuse was not determined There were no localizing neurologic signs Generalized motor weakness of the lower extremities without atrophy was noted A roentgenogram disclosed a unilateral sacralization of the fifth lumbar vertebra which was not considered significant in the production of the patient's complaints He was seen by orthopedic, genitourinary, surgical, medical, and neurological consultants, all of whom reported no organic disease

The patient failed to respond to a 3-month course of therapy consisting of bed rest with bedboard heat, physiotherapy, exercise, reassurance, et cetera, and was transferred to another hospital within the Theater "for disposition "

Comment This patient had a reasonably common congenital defect which was *not* incapacitating or productive of symptoms His history alone was immediately suggestive of psychogenic backache Physical examination and meticulously detailed studies were all negative He was told that he was suffering from "chronic back strain" and treated *as though* he had true organic disease despite negative physical findings and history He was hospitalized for 3½ months and failed to improve on treatment which was aimed at the symptom rather than the underlying cause He was eventually transferred for further hospitalization and disposition He refused to accept the medical conclusion based on a thorough work up and insisted that he had a "chronic back sprain" which prevented him from doing duty saying, "You can send me back to duty but I just know that I can t do it and I'll have to come right back into the hospital "

Complaints of backache are particularly common during basic training If regarded as indicative of disease and deemed incapacitating despite a negative history and the absence of physical findings iatrogenic back disease with virtually complete incapacitation ensues When this patient's complaint was regarded

after arriving in Korea The pain came on while he was on his first patrol action He completed the mission then reported to sick call was advised to rest and was given APC capsules The pain disappeared and he returned to duty on the following day The pain recurred and he was again seen on sick call Physical examination at that time was negative and he returned to duty He reported to sick call a third time and was admitted to the hospital where a surgical work up was negative and he was transferred to the neuropsychiatric service He stated that he had had the first attack of pain while participating in the obstacle course during basic training The pain was not incapacitating and he was able to carry out all of his duties successfully He was told of the negative findings and advised to learn to live with the pain He returned to duty but was re evacuated 2 days later with a note from the medical officer stating This man complains of severe pain in his leg and will be evacuated every day if nec essary until something is done for him " At the time of his sec ond admission he had a bizarre limp and was openly hostile stating that the battalion surgeon is the only one who under stands me He knows how sick I am and he looks out for me

He openly refused to return to duty and stated that nothing was being done for his pain All attempts at rehabilitation failed He filed a complaint with the inspector general about the doctors who mistreated him

Comment At the time this patient was first seen on the neuropsychiatric service it was evident that he was not suffering from an organic lesion and that his complaint of pain did not in capacitate him in any way for combat service On his 2 patrol mis sions he was able to keep up with the group and voiced no com plaint until after the mission was over He was reasonably well motivated and seemed to accept the injunction of live with it He capitalized on the overly sympathetic attitude of the battalion surgeon and thereafter refused to perform further duty on the grounds that he was too sick

HOSTILITY OF MEDICAL OFFICER

Hostility on the part of the medical officer towards his soldier patient may also serve to fix and intensify the patient s com-plaints Here again through the process of rationalization the physician s attitude can be shaped to meet the patient s needs Thus an outburst of anger on the part of the physician may lead the patient to believe that the doctor does not know what is wron with him and that that is why the doctor is so mad (He is not a good doctor and I'm really sick) Thereafter the patient s symp-toms may become more intense and more diversified as he at-tempts to prove that the doctor does not know what is wrong with him

Too frequently complaint and incapacitation are considered to be synonymous That this is not the case is evidenced by the large number of people both in civil and military life who satisfactorily perform their daily work despite the presence of such subjective complaints as headache, backache, weakness, dizziness, et cetera Although the physician's mission is to alleviate suffering it is equally true that he cannot be expected to relieve every patient of every complaint. The patient who suffers no true organic disease but who offers a persistent subjective complaint may fail to get well in spite of treatment and the physician must not feel constrained to order more tests, more studies, and more consultations in an effort to cure the patient of his supposed incapacitation It is far more helpful for the patient to be told that his complaint has been investigated and found to have no organic cause and that he must learn to live with it

The unthinking statement and the slip of the tongue may further the development of iatrogenic disease The 'open chart' as a producer of iatrogenic disease is illustrated by the following case report

Case 5 A 22 year old officer was admitted to a hospital in Japan as a surgical evacuee from Korea with the diagnosis, shell fragment wound of the right thigh with severance of the sciatic nerve He had volunteered for duty in Korea and was wounded in action in November 1951 He was unable to move his left leg and had anesthesia over the right sciatic nerve distribution below the level of his wound Surgical exploration of the supposedly severed nerve was not carried out and the patient was evacuated to Japan

Initially the wound was clean and there was indication of return of function of the sciatic nerve The impression of severance was changed to severe contusion and secondary closure of the wound was performed The wound healed well but the patient continued to have evidence of severe weakness of his right foot and complained of anesthesia of his foot and calf He was early encouraged to walk using a cane He was given physiotherapy but failed to make consistent progress He seemed reluctant to cooperate in his treatment and refused to exercise When a psychiatric consultant questioned him about his lack of co-operation he said that he read his chart daily and had gone to the medical library to learn about severance of the sciatic nerve adding, "That's a very serious thing and it's important that I not walk." He then stated that he had seen the change in diagnosis to contusion and had read about this condition in the medical library adding "That's not as bad as a severed nerve but it's still very serious and I really shouldn't move the leg at all."

Comment Actually this patient suffered only a mild contusi of the sciatic nerve There was prompt return of some funct within 3 days of his injury Electrodiagnostic studies of sciatic nerve demonstrated minimal loss of function The pati had little faith in his physicians because of the change in di nosis which appeared in his chart He was firmly convinced t he had suffered extensive damage to the nerve and his fail to co-operate in his treatment was a direct result of this He developed iatrogenic sciatic nerve palsy as a result of reading clinical record and finally had to be evacuated to his homeland cause he was "incapacitated for active duty

RASH STATEMENTS BY MEDICAL OFFICERS

Although the patient should always be informed of the fact t he is being evacuated or transferred certain unthinking sta ments should never be made by the physician I m going to se *you back to Japan and they will operate and cure you"* is an ample for should the doctor in Japan as a result of his exami tion, studies and previous experience decide that an operation contraindicated he is then in an awkward position because the tient has already been told that he was to have an operation amount of reassurance will convince him of the fact that an ope tion is not indicated and invariably his condition will beco worse while he attempts to convince both himself and physician that a mistake has been made

Case 6 A 24 year old soldier was originally admitted to t hospital in Korea with a fractured nose and transferred to an Ar hospital in Japan with a diagnosis of deviated septum seconda to fracture of the nose He had been struck in the nose with bottle during a fight and had sustained a fracture of the no which was reduced Postoperatively he developed a seconda infection of the nose which responded to chemotherapy and was returned to duty 1 week later Thereafter he was seen r peatedly on sick call complaining of pain in the nose and dif culty in breathing Examination failed to disclose any obstructi to the airway but after repeated visits he was rehospitalized a told that he was being evacuated to Japan for an operation whic would cure him

On admission the fracture was found to be healed and there wa only slight disfiguration A slight septal deviation was prese but the passageway was patent and the patient could breath easily No indication for operation existed and the patient wa informed that he was to be returned to duty He became ho ule and abusive and a psychiatric consultation was requested Durin this interview he repeatedly stated that the doctors were doin nothing for him His negative findings were reviewed with hi

but he insisted that he was unable to breathe properly and that only an operation would cure him

Comment There was no indication for operating on this patient but he lodged a formal complaint against his medical officer claiming improper treatment and insisted that he could not perform duty His faith in physicians was destroyed and it was impossible to reassure him that he suffered from no organic disease It is wise never to promise the patient anything for which you yourself are not directly responsible and which you personally cannot fulfill False promises destroy the patient's faith in all physicians and preclude successful reassurance at a future date when such treatment may be essential

SUMMARY

Factors are present in both the military patient and the medical officer which explain the high incidence of iatrogenic disease in the Army Most prominent of these are the failure to recognize the normal visceral responses to anxiety, and the failure to treat properly patients with psychogenic disease In both instances treating the patient *as though* he were sick serves to fixate his anxiety at the somatic level and to neglect the underlying emotional cause Doubt, indecisiveness, and insecurity in the medical officer are reflected in his treatment, examination attitude, and disposition of the case and predispose to the development of iatrogenic disease

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BOOK REVIEWS

Architectural Principles in Arthrodesis by *H A. Brittain*, O B E M A M Ch F R. C. S Director Orthopaedic Services Norfolk and Norwich Group of Hospitals Hunterian Professor Royal College of Surgeons England et cetera with a Foreword by *Sir Harry Platt* M D M S. F R C. S. F A C. S (Hon.) Emeritus Professor of Orthopaedic Surgery University of Manchester President of the International Orthopaed Society Consultant Adviser in Orthopaedics Ministry of Health 2d edition 196 pages illustrated Williams & Wilkins Co Baltimore Md publisher 1952

The author begins the second edition of this monograph by discussing the indications for arthrodesis the common causes for failure of the procedure, and the architectural principles which should be followed in its performance He then discusses his application of these principles in the operations which he favors for ankylosing the major joints of the body A chapter is devoted to the technic for obtaining bone grafts with particular

emphasis on the tibia as a source for these and with only pas ing mention of the use of the iliac bone which he believes possesses certain limitations

Dr Brittain describes in detail his operation of ischiofemoral arthrodesis as well as a procedure which he terms the "V arthrodesis of the hip " The latter, he believes is advantageous in the elderly or debilitated patient because little or no immobilization is required The author s technics for arthrodesis of the knee ankle wrist, elbow, and shoulder are thoroughly described and in each instance one or more of the basic principles which he considers so important are incorporated His method for obtaining spinal fusion combines some of the best features of the tech nics of Albee Hibbs and Bosworth stress being laid here as elsewhere on the principles to be followed

The final chapter is devoted to a description of the Naughton Dunn stabilization of the foot an operation which enjoys the same popularity in Great Britain as does the triple arthrodesis of Ryerson in this country The book is replete with illustrations including many reproductions of roentgenograms The author s consistent application of the architectural principles which he has outlined is impressive This book will prove to be of great interest to all physicians associated with orthopedic surgery

—*Lt Comdr J H Cheffey MC USN*

Fi l ty a d Form by *W S M C ll ch* M D P f s o f Psych try nd Phys ol gy N ur phy l g st Dep rtme t f P y hi try Un v ity of Illi oi C lleg of M d Illin Neur p ych tr I t tute Ch c g Ill P bli tio N mb r III Am n L ctur Se es A M g ph t Ame a L cture n Psych logy Ed t d by *Molly R H owe* Ph D R e ch nd C lt g P y h l g New Y k N Y 63 pag ll trat d Ch rl C Thom P blish r Sp gf ld Ill 1952 P ice $3 75

This monograph was originally delivered by the author as "Finality and Form in Nervous Activity on 2 May 1946 at the American Museum of Natural History, New York N Y as the fifteenth James Arthur Lecture on the evolution of the human brain Four appendexes have been added to the original lecture to bring it up to date Using the results of important neurophysiologic research by himself and others Dr McCulloch hypothesizes the mechanisms of the highest and most complex functions of the nervous system Although the book is well illustrated with diagrams, a background of neurophysiology would be essential for the reader to fully comprehend the concepts advanced by the author —*Lt Col O M Weaver MC USA*

ORAL SURGICAL PROBLEMS ENCOUNTERED BY THE EXODONTIST

ROBERT H MARLETTE *Major DC U S A* (1)

CERTAIN aspects of minor oral surgery can be performed in Army surgical clinics with the same degree of success as that achieved by the specialist in private practice The zeal, diligence, and ability of the practitioner are the determining factors Because it is not feasible to assign a board-qualified oral surgeon to each post or station, exodontists and general practitioners who have an interest and aptitude for surgery should perform the necessary operations in these installations Because of the pressure of routine extractions these dentists often refer or transfer patients whom they are capable of treating Far from urging the neophyte in oral surgery to attempt treatment beyond his ability, I hope to stimulate the hesitant to give serious thought to comprehensive examination, better diagnosis, and early surgical treatment when needed This will result in maximal service to the patient, a decrease of time lost for the soldier, and greater efficiency within the training organizations

One of the major problems in medicine today is cancer The dentist must play a vital role as a cancer detection agent About 50 percent of all cancers of the head and neck are seen first by a dentist (2) Every lesion of the buccal mucosa, lips, or tongue *should be considered precancerous, or cancerous until proved* otherwise

The exodontist should be able to make a differential diagnosis between (1) membranous lesions such as aphthae, mucous patch, or thrush, (2) nonmembranous lesions such as leukoplakia, lichen planus, or cheek biting and (3) bullous lesions such as pemphigus erythema multiforme, and stomatitis medicamentosa Lesions of the lips include chancre mucous retention cyst, perleche, cheilitis aphthae, papillomas verruca, and carcinoma A biopsy specimen should be taken from most solid cellular growths in order to establish the diagnosis Tumors of the tongue, neck,

(1) U S Army Dental Unit Fort Leonard Wood Mo

(2) Sarnat B G and Schour I Oral and Facial Cancer Year Book Publishers Inc Chicago Ill 1950 p 7

lymph glands and upper half of the face should be referred to the specialist who will perform the biopsy and any surgical treatment indicated Too many dentists dismiss lightly small innocuous appearing lesions of the mouth which could be readily excised when first seen and diagnosed in the laboratory

It is less dangerous to take a biopsy specimen with a clean sharp instrument than it is to have several observers manipulate and traumatize a lesion by palpation during the course of the examination Taking a biopsy specimen may contribute to early metastasis In taking such a specimen a representative region should be chosen The section removed should be thin and deep rather than broad and shallow and should include normal surrounding tissue taken through the margin of the lesion An elliptical section is desirable with cuts made vertical to the mucosal surface and converging to a V in the underlying tissue Total biopsy is always indicated when the lesion is small Crusts or sloughs from the lesion are not submitted for study Crushing or mutilating the specimen should be avoided and after removal the specimen should be placed in 10 percent formalin A report from a pathologist stating no malignant condition found should not lull the oral surgeon into a false sense of security when the clinical course of the lesion suggests malignancy In such cases a second biopsy specimen should be taken

Any malignant lesion of the mouth is easily recognized easily treated and easily cured if seen early The recognition of lesions of the mouth has been stressed within our installation and as a result the volume of lip cheek and tongue lesions treated in our exodontia clinic has more than trebled in the past few months

Another diagnostic problem often encountered in general practice and frequently seen among Army personnel is temporomandibular joint pathology The anatomy of this joint is of special importance to the dentist because it is by this means that the denture is articulated Disturbances in the articulation usually result in disturbances of the occlusion The action and physiology of the joint is well understood but the purpose behind the abnormal openings deviations of the condylar path overclosure and ankylosis of the joint often remains shrouded in mystery Conditions resulting in facial asymmetry and tumors of the glenoid fossa are beyond the scope of the exodontist but in a few selected patients accurate diagnosis will result in a simplified treatment plan

Temporomandibular articulation syndromes are more often overlooked than recognized Frequently patients who complain of abnormal opening clicking noises and chronic subluxation are erroneously advised to ignore their symptoms others are ad

diagnosed as atypical trigeminal neuralgia, avitaminosis, otitis media, or nonspecific parotitis (3) The diagnosis of a temporomandibular joint disorder is difficult, but in the absence of acute inflammation and erosion of the condyles or glenoid surfaces most patients can be treated successfully by the alert exodontist If the patient does not have a simple overclosure, and if all the available evidence indicates merely an excessive excursion and crepitation due to abnormal looseness of the capsular ligament, injection of a 5 percent sodium psylliate emulsion into the joint cavity is the treatment of choice (4) We have modified this technic by routinely injecting a long acting analgesic such as nefocaine into the joint cavity 2 hours prior to the sodium psyllinate injection This eliminates the often severe postinjection symptoms frequently encountered

A specialist's knowledge of the technics used in the removal of simple impactions, although desirable, is not essential An impacted third molar can be removed easily, efficiently, and with a minimum shock to the patient by adhering to a few basic principles of flap design, conservation of blood supply, minimum amount of bone removal, and careful postoperative treatment A properly made mucoperiosteal flap is the first essential We favor the "southwestern" incision in which the tissue is undermined at the neck of the second and first molar and carried over the impacted area distally and medially toward the lingual plate at a 45 angle to the distal surface of the second molar The incision must extend to the bone, otherwise the uncut periosteum will cause the gum to tear on deflection The controversy regarding bone removal versus tooth sectioning has generally been resolved in favor of tooth sectioning, but, in most patients with impactions, a minimum amount of bone must be removed

The question arises as to the use of a chisel, impactors, or bone burs A combination of technics offer the best results I follow the method of Cryer and use bone drills in the dental handpiece to perforate the bone with a series of holes, then unite them with a hand chisel If a tooth is to be sectioned, I prefer the use of the impactor for the purpose of sectioning only In most patients a crosscut fissure bur inserted deep into the mesial or distal root of the impaction, either before or after sectioning, can create access for insertion of an exolever by which either the whole tooth or individual roots can be elevated without injuring the adjacent tooth or buccal plate of bone

A word of caution must be given to those who attempt extractions and find they misjudged the ease of removal As a general

(3) Epsteen C. M Temporomandibular articulation syndrome Am J M Sc 221 457 461 Apr 1951

(4) McKelvey L. E Sclerosing solution in treatment of chronic subluxation of temporomandibular joint J Oral Surg 8 225 236 July 1950

rule, mesially inclined, lower third molars with the crowns lyin no lower than the gingival crest are considered simple impac tions Vertically impacted molars with their crowns lying below the crest can be very difficult to remove The removal of distally inclined impactions is not so difficult if they are located so far forward that the anterior crest of the ramus does not interfere with removal of the crown The removal of horizontal impactions often appearing complicated may only require removing the crown sectioning the roots and removing them in the space creat ed by the crown removal The removal of impactions lying near the inferior border of the body of the mandible and the removal of teeth lying deep or superiorly in the ramus should not be attempted without special training and skill

Contrary to the popular conception, the removal of upper third molars is not simple The removal may be made with ease but the danger of complications involving the adjacent sinus and heel of the maxilla demands that sound surgical judgment be applied before the operation is attempted. For this reason deeply embedded upper third molars should be left to the operator trained in their removal

Another important oral surgical problem is fracture of the maxilla or mandible Treatment of this type of injury has often been needlessly complicated placing it seemingly beyond the scope of the exodontist Most simple jaw fractures, however, can be treated in an exodontia clinic if the operator has a thor ough knowledge of the anatomy and physiology of the face and jaws It should not require specialized training to learn the tech nic of intramaxillary wiring I prefer the multiple loop technic *(5)* A simple maxillary fracture can be immobilized by the use of the Winter arch bar, and mandibular fractures can be wired to the intact upper teeth for stabilization and reduction Edentulous spaces should present merely a problem in the mechanical appli cation of a proper design for a gold screw lock type of splint with soldered bars and lugs, placed to receive the proper traction for reduction In our clinics exodontists have treated 13 fractures of the mandible or maxilla since January 1952 with excellent results—good occlusion no nerve or muscle deformity and no impairment of function

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(5) N t on l R s h C un il Di on f M dic l Scie c s Ma ual of St da d Pr t c f Pl st c nd M x llofa i l S rg ry Pr pa d d d ed by the S b mm ttee n Pl t c and M x llofa i l S gery f the Comm t e n Surg ry f th Di i o of M di l Sc e f th N to l R e h Cou il a d R p s t t e f th M di l D pa tme t U S Army (Mil ary Surgic l M u l V l I) W B Sau d r Co Ph ladelph P 1942 pp 272 276

It is seldom necessary to consider a fractured jaw an emergency per se Usually floating fragments require from 4 to 10 days for fibrous union A serious fracture is generally accompanied by massive edema, ecchymosis, ptosis, and external or internal lacerations which make reduction difficult and unnecessarily painful to the patient if attempted immediately after injury The edema should be reduced, an airway should be established, antibiotics should be given, and measures should be taken to prevent shock before reduction of the fracture is attempted, unless a compound fracture is present Reduction can normally be accomplished 2 or 3 days after injury While the patient is in traction, it is important to start daily oral irrigations and mouth stimulation to maintain the tonus and vitality of the gums

A frequent mistake is to remove the appliances too soon Traction should be applied at least 3 weeks for maxillary fractures and 6 weeks for mandibular fractures Postoperative roentgenograms will indicate the alinement of fragments and the absence or presence of callous formation Treatment of a fractured jaw depends primarily on sound surgical judgment Experience will only be gained by the proper application of the skills and ability inherent in the individual practitioner

SUMMARY

Dentistry in the Armed Forces should give maximal service to the patient by making the most efficient use of the abilities and skills of the dental officers Excision and biopsy of oral lesions is not beyond the skill of the average exodontist and it is urged that every dentist be cognizant of the importance of early recognition of oral and facial cancer The treatment of chronic subluxation of the temporomandibular joint is not exceptionally difficult and may be accomplished by an exodontist Removal of simple impactions by the relatively inexperienced can be performed by adhering to the basic principles of surgery Treatment of a fractured jaw may also be within the scope of the exodontist's ability

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BOOK REVIEWS

Annual Review of Medicine Volume 3 Editor *Windsor C. Cutting* Stanford University School of Medicine Associate Editor *Henry W. Newman*, Stanford University School of Medicine 442 pages Annual Reviews Inc Stanford Calif publisher 1952 Price $6

Review articles have always maintained a popular appeal in medicine and this concept has been recently extended by the

authors of this volume to the broad field of internal medicine This new volume represents the efforts of 17 contributors and covers clinical laboratory and experimental medicine It does not duplicate the Year Book of Medicine but offers an interpretation and integration by the contributor of those subjects falling within his special field There is thus a continuity of thought and style which makes for greater readability An extensive bibliography is presented at the end of each section The last section of the book consists of an annotated list of review articles which have appeared between January and October 1951 An author and subject index adds to the book's value as a reference work Much time and thought have gone into the preparation of this volume, and the resultant product merits the consideration of the internist who desires to keep abreast of the significant developments in his field

—*Lt Col O A Wurl MC U S A*

Th Para ite of Dom sti Anim l A Ma ual f V t nary S ud t nd S g o by *Tb ma W M Cam* T D M A Ph D D Sc M R C. V S F R S C. P f of P r t logy M G ll U er ty D tor of th I t tut f P s l gy M D ld C ll ge Ca da 2d d tio d d enl rg d 420 pag llustrat d J B L pp c tt Co Ph l d lph P publ b 1952

In this new edition of a work first published in 1934 and entitled "The Internal Parasites of Domestic Animals the subject matter has been brought up to date and several new chapters have been added one of which deals with arthropods of veterinary importance which accounts for the change in the title The title page of this edition states that it is A Manual for Veterinary Students and Surgeons It is considered that the term manual" which suggests a handbook that may be used for quick reference is somewhat misleading in this instance Actually the book is considered to be an excellent textbook for students and a fine reference work for others interested in the subject.

The book includes host lists a bibliography, and an index It is profusely illustrated with microphotographs and drawing depicting the life cycles of important and commonly occurring parasites Although treatments are given for each external parasite as it is discussed the treatment of helminths is lumped into one chapter The chapter on technic has been written essentially for the practitioner who does not have access to a well equipped laboratory, and contains much practical information

—*Lt Col A H Hillers VC U S A*

PREDICTING THE EFFICIENCY OF PROBLEM SOLDIERS

JOHN W BURNETT *Major MC U S A* (1)

THE psychiatrist assigned to an infantry division in combat renders valuable service Is there, however, any justification for assigning a psychiatrist to a division in a noncombat status? The division psychiatrist has a number of duties, but one of his chief tasks is making recommendations when soldiers are referred to him by unit medical officers and commanding officers The soldiers referred to the psychiatrist have in most instances become a problem in their unit, a thorn in the side of their company commander or unit medical officer For this reason they will be referred to as "problem soldiers " These soldiers present a variety of personality problems, the commonest being chronic disciplinary problems, frequent appearance on sick call, insistence on discharge from the service or reassignment in a limited duty status because of a minor physical or mental defect, and reaction to the minor stresses of noncombat service with nervousness, homesickness, or actual neurosis or psychosis A decision must be made as to whether administrative discharge, hospitalization, or continuation on duty is in the best interests of both the patient and the service This must be done before any attempt at environmental manipulation or psychotherapy is initiated

The division psychiatrist is often simultaneously charged with coddling and harshness in his relationship to the soldier He is charged with making decisions arbitrarily and often not in the best interests of the service In this division a survey was conducted in an attempt to answer the following questions

1 Is a prediction of future performance of "problem soldiers" by the division psychiatrist of any value?

2 Does this justify assigning a psychiatrist to an infantry division in a noncombat situation?

Procedure A questionnaire was devised and sent to the unit commander of every enlisted man who had been seen by the division psychiatrist between 1 February 1951 and 1 February 1952 During the first 4 months of this period, the division was in

(1) 4th Infantry Div a

the continental United States and the remainder of the time en route to and in the United States Zone of Germany Of 351 questionnaires sent out, 306 were returned Of this number a recommendation to continue on duty had been made on 273 of the subjects who were believed to be an asset to the service The remaining 63 had been recommended for administrative discharge because of inaptitude or unsuitability (AR 615 69) or unfitness (AR 615 368, AR 600 443) All men included in this survey had been seen at least 3 months prior to requesting the unit commander to complete the questionnaire

Questionnaire

1 Soldier s efficiency is (3) superior (2) satisfactory (1) below average (0) inefficient

2 He goes on sick call (0) frequently (1) often (2) seldom

3 He is unable to perform consistently useful service because of physical or mental symptoms (0) Yes (2) No

4 He has become a frequent offender disciplinary problem or chronic AWOL (0) Yes, (1) No

5 His effect on the morale of other men in his unit is (2) good (1) indifferent (0) bad

The numerical values shown in parenthesis permitted a maximum score of 10 and a minimum of 0 (average about 7) A score of less than 6 was taken to indicate unsatisfactory performance of duty and a score of 8 to 10 was taken to indicate superior performance

Results The 273 recommended for continuance on duty and who were on duty at the time of the survey received an average rating of 7 8 The 63 who were recommended for discharge but who were on duty at the time of the survey received an average rating of 5 4

Comment Recommendations as to whether a man should continue on duty or be discharged was based on the following criteria The soldier s current degree of efficiency his past military adjustment his basic life long patterns of adjustment, and the degree of precipitating stress Poor motivation or statements of inability or unwillingness to perform duty were only considered in connection with other criteria Physical profile changes and recommendations for limited duty assignments were initially used but abandoned because of administrative impracticability To a certain extent this survey was weighted by the greater emphasis on reassurance guidance and psychotherapy given those who were recommended for continuance on duty

CONCLUSION

The average efficiency of those soldiers in the 4th Infantry Division who were recommended for continuance on duty by the division psychiatrist was compared with the average efficiency of those recommended for discharge The average efficiency of those recommended for continuance on duty compared favorably with that of the average soldier Those who were recommended for discharge were, on the average, inefficient in their duties It is, therefore, concluded that a prediction of the future performance of problem soldiers by a division psychiatrist in a noncombat situation is sufficiently accurate to be of value and that many problem soldiers, if properly selected, can render useful military service The prediction of the efficiency of the problem soldier at the division level would be expected to be more accurate than such a prediction at the hospital level because of the ability of the division psychiatrist to deal more directly with both the referring physician and the unit commander

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BOOK REVIEWS

The 1951 Year Book of Pathology and Clinical Pathology (January December 1951) Pathology edited by *Howard T Karsner* M D LL D Medical Research Advisor to the Surgeon General United States Navy Clinical Pathology edited by *Arthur Hawley Sanford* M A M D Emeritus Professor of Clinical Pathology Mayo Foundation Emeritus Consultant Division of Clinical Laboratories Mayo Clinic Director of Laboratories Rochester State Hospital 454 pages illustrated The Year Book Publishers Inc Chicago Ill 1952 Price $5 50

This annual volume once more accomplishes the difficult task of consolidating the important and essential advances in the specialty which have occurred during the period The format is one conducive to the orderly presentation of the subject matter The special articles, which include such timely discussions as those on epidemic hemorrhagic fever, the pathogenesis of arterial lesions and of atherosclerosis, are of such excellence that the reader might well wish that additional special presentations were included It is unfortunate that the editors restricted their personal comments, presumably to hold the volume down to a reasonable size Many topics are of such controversial nature that the average reader would benefit by a few additional words of editorial direction The section on clinical pathology will be appreciated by many for its numerous references to new and improved technical methods, in addition to abstracts of articles

evaluating their worth The accumulation of yearly volumes over a span of time provides a starting point for the investigation of new problems as they arise in the daily practice of laboratory medicine Clinicians as well should find this volume of value

—Lt Col F A Mantz Jr MC U S A

D betic Glomerulosclerosis Th Specific Rel tion of D abetes Mellitus to Renal Lesions by *Harold Rifkin*, M D F A C P Lecturer in Medicine College of Physicians and Surgeons Columbia University Adjunct Attending Physician in Medicine and Assistant Professor of Medicine Hospital Associate Medical Director Flower-Fifth Avenue Hospital New York Medical College New York N Y *Louis Lee* M D Ph D Clinical Professor of Medicine College of Physicians and Surgeons Columbia University Chief of Medical Division Montefiore Hospital New York N Y and *James Bikerman* M D Instructor in Pathology College of Physicians and Surgeons Columbia University Associate Pathologist Montefiore Hospital New York N Y A monograph American Lecture in Metabolism American Lecture Series Publication Number 130 102 pages Illustrated Charles C Thomas Publisher Springfield Ill 1952

This comprehensive monograph is an excellent presentation of the more recent knowledge on diabetic glomerulosclerosis usually known as Kimmelstiel Wilson syndrome Several case histories are presented to illustrate the clinical aspects followed by a discussion of the pathology pathogenesis and clinical and laboratory abnormalities found in this disease The authors explain how a properly performed urinalysis in which the urinary sediment is examined for doubly refractile lipoid droplets in renal cells or casts containing cholesterol esters in addition to neutral fats is one of the important means of diagnosis in the disease A helpful outline for the differential diagnosis is given toward the end of the book ending with a chapter on treatment At present the latter is not very satisfactory consisting entirely of supportive forms of therapy in controlling the primary diabetes mellitus and maintaining a proper control of the blood electrolytes Physicians are encouraged to study all patients with diabetes mellitus thoroughly at the onset of the disease and to follow each patient closely for the rest of his life The book is of primary interest to the specialist in internal medicine and the clinical pathologist *—Col U R Menkangas MC U S A*

OCULAR FATIGUE IN THE RADAR OPERATOR

RALPH S RIFFENBURGH *Lieutenant MC U S N R (1)*

IN working with patients from both ships and airfields where ground controlled approach units were stationed, it was found that a disproportionate number of radar operators presented themselves at the eye clinic with complaints of tiring and headache during or following their work A study of the causes for this was undertaken

Previous studies have shown relatively little biologic effect of radar Follis *(2)* subjected guinea pigs to prolonged exposure to radar and found no changes on microscopic study of various organs, including the eye Daily *(3)* found that about 22 percent of radar research personnel developed frontal headache and occasional intraocular pain, but only after several hours of direct exposure of the face to the transmitter unit, working at full capacity

Observation of working conditions and discussion of them with several crews have shown that there is great variance of conditions under which different groups work The greatest variation from one group to another was found in the time a man remained on watch The most frequent length of watch at one time was about ½ hour, with a maximum on one ship on which the men watched the radar screen for a full 4 hours

Examination of these men reveals in only a small percent of the cases any refractive error or ocular muscle imbalance which could be considered even a possible cause of symptoms A number of suggestions will be made to lessen the incidence of tiring and ocular symptoms among radar operators None of these will relieve the man who has an actual pathologic condition to account for his symptoms, and a complete examination of the eye is indicated to rule this out

No man should have to actually watch the radar gear for more than ½ hour at one sitting and a shorter time than this is prob

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(1) U S. Naval Hospital Mare Island Vallejo Calif at time of writing now at Washington University School of Medicine St Louis Mo

(2) Follis R H Jr Studies on biological effect of high frequency radio waves (radar) Am J Physiol 147 281 283 Oct 1946

(3) Daily L E Clinical study of results of exposure of laboratory personnel to radar and high frequency radio U S. Nav M. Bull 41 1052 1056 July 1943

ably to be preferred This does not necessarily mean more men on watch, but more frequent change-offs because the period of rest necessary before returning to the radar gear is short, If a unit is shorthanded it is certainly not necessary for the man to have complete rest for this period only ocular rest and he may change off with for example, the man on the voice communication system

Radar operators who have been trained in the radar schools have been taught to watch the radar screen only intermittently looking away at frequent intervals There are however many men standing radar watch who have been trained haphazardly aboard ship Many of them believe that it is necessary to keep the eyes focused on the radar screen at all times Often this concept is fostered by untrained officers who insist that constant watch be kept The habit of looking away for a period of at least slightly less than one sweep every three or four sweeps unless a contact is being followed should be taught Often it is practical to look away longer than this

As in many other occupations posture is a factor in time of tiring and a check should be made of the seating arrangements They should be such that the operator can be comfortable and relatively relaxed with adequate back support

There is undoubtedly an increase in tiring at certain speeds of sweep of the radar but further study is necessary to determine the optimum speed combining both maximum comfort and efficiency in picking up contacts At present the operator should be advised to pick that speed within the range advised for the type of search being conducted which is most comfortable

It is usual for the operator to watch the screen in the most nearly complete darkness obtainable As with television however too high a contrast level increases the rate of fatigue thus making complete darkness not advisable The optimum level of contrast between the screen and the surroundings is another factor which needs controlled research and can now only be adjusted empirically to that found to be most comfortable

It might be advisable to have available near the radar apparatus a pair of red goggles similar to those used by pilots for dark adaptation prior to night flying When it is necessary to leave the relatively darkened area where the radar is located and be exposed to bright sunlight, these would lessen the discomfort of the sudden contrast which may lead to headache They would also make the adaptation to a functioning level quicker when the return to reduced illumination is made

EFFECTIVE TEMPERATURE AS A MEASURE OF HEAT EFFECT[1]

GEORGE A HEFFERNON *Colonel MC U S A*
HERMAN J HITTNER *Second Lieutenant MSC U S A*
STEPHEN L KOCIS *Private A U S*

IN June and July 1952, when the temperature soared to record heights, the post surgeon was often asked for an opinion as to when the daily post activities should cease in order to reduce the number of casualties due to the effects of the heat. Formulating such an opinion is difficult, yet such a decision must at times be made. The necessity to secure data on which the surgeon could base his advice to his commanding general launched the Preventive Medicine Section at this post on a study to determine some combination of temperature, humidity, and wind velocity which could be used as a basis for a recommendation.

A search was made of many manuals and books relating to body comfort, but it appears that there is a great deal of disagreement on the subject of comfort and the ability to do work under "hot" conditions. Various studies have been made with regard to relative humidity and air temperatures, but no agreement was reached until the problem was investigated by the Research Laboratory of the American Society of Heating and Ventilating Engineers in co-operation with the United States Bureau of Mines and the United States Public Health Services (2). In their work on metabolism, pulse rate, rectal temperature, change in body weight, effect on systolic and diastolic pressure, and work output, it was concluded that the 3 factors, temperature, humidity, and wind velocity, could be varied over a wide range and a person would still feel the same degree of comfort. Accordingly the term "effective temperature" (ET) was introduced so as to include these 3 factors in a single, common term and a nomogram was developed by which the ET could be read if the dry bulb temperature, the wet-bulb temperature, and the wind velocity were known.

Various investigators have concluded that there is no particular point of comfort (even with regard to the ET scale) but that

(1) U S Army Hospital, Fort Lee, Va.

(2) Rosenau, M. J. Preventive Medicine and Hygiene, 6th edition. D. Appleton Century Co., Inc., New York, N. Y., 1935, pp. 879, 880, and 887.

TABLE 1 *Data n heat ff cts J e a d July 1952*

Dat	Noon					High					
	R H	D B	W B	W V	L T	R H	D B	W B	W V	T T	Pati t
J e 1	60	80	71	600	69	52	85	72	450	74	0
2	42	75	61	350	65	38	78	62	350	67	0
3	47	80	66	250	71	44	83	68	350	72	6
4	52	88	73	450	76	42	90	73	250	77	5
5	55	82	70	350	72	50	86	73	250	77	4
6	16	91	75	350	79	38	94	76	600	80	6
7	42	92	74	525	78	41	94	75	525	80	3
8	40	84	67	250	73	36	90	0	250	77	0
9	34	95	73	600	79	30	96	72	525	79	1
10	59	85	74	525	74	51	89	74	700	76	0
11	43	79	64	525	67	37	83	65	600	70	0
1	44	75	61	350	65	42	78	65	350	67	0
13	34	81	63	250	70	27	85	64	250	73	0
14	41	86	69	525	73	36	90	70	600	75	2
15	72	81	74	450	72	75	85	74	350	75	0
16	69	84	70	450	75	59	91	79	600	79	1
17	61	89	78	00	77	54	93	79	880	79	1
18	37	88	69	525	74	40	92	69	525	70	2
19	33	93	71	700	77	28	96	71	600	78	2

TABLE I. Data on heat effects [ne and] ly 1932—Continued

Date	Noon					High					
	R H	D B	W B	W V	I T	R H	D B	W B	W V	I T	Patients
June 20	39	81	64	350	70	44	85	65	350	72	0
21	73	80	71	525	70	70	85	75	250	77	0
22	78	78	72	100	74	68	81	75	Calm	79	0
23	74	82	73	Calm	78	64	87	75	250	78	2
24	55	85	76	250	77	44	95	78	250	82 5	3
25	46	98	79	350	83 5	40	101	78	350	84	8
26	40	101	77	450	82 5	34	105	75	450	84	8
27	49	100	80	450	84	46	101	81	350	85 5	21
28	62	92	79	250	82	56	96	80	350	83	8
29	62	93	81	450	82	58	95	81	450	83	0
30	54	85	76	450	75	59	87	76	450	76	0
July 1	44	76	62	700	64	43	78	63	700	65	0
2	43	79	65	450	68	42	83	66	525	70	1
3	46	85	71	800	72	42	88	70	700	71	0
4	52	87	74	700	74	44	92	74	700	77	0
5	55	87	75	350	77	53	88	74	350	77	1
6	56	87	76	250	78	54	87	75	250	78	0
7	86	76	72	450	67	86	76	73	450	68	0
8	83	77	73	525	69	68	82	75	800	71	0

TABLE 1 *Data / at ff t J d J ly 1952* —C d

D t	N n					H gh					
	R H	D B	W B	W V	E T	R H	D B	W B	W V	E T	P t t
J ly 9	66	84	75	600	73	60	89	77	250	80	0
10	54	80	67	450	69	52	85	69	350	73	0
11	48	88	70	C lm	78	44	89	74	C lm	80 5	0
12	45	88	70	250	78	45	90	75	250	80	0
13	42	90	74	250	79	42	92	74	350	79	0
14	46	91	76	525	78	46	92	77	525	79	3
15	50	91	77	700	78	50	93	77	700	79	3
16	55	90	77	450	79	50	95	77	700	80	1
17	55	91	77	350	80	52	92	77	250	81 5	2
18	58	93	79	88	83 5	54	97	80	250	84 5	5
19	46	96	79	250	83 5	46	96	78	350	82 5	4
20	48	93	77	250	81 5	52	95	77	250	82 5	0
21	50	96	79	88	84 5	45	100	79	350	84 5	22
22	49	97	79	250	84	42	102	80	350	85 5	43
23	40	101	79	350	84 5	36	104	78	350	85	42
24	52	88	75	250	78	42	92	4	350	79	2
25	42	86	61	350	74	38	88	69	350	75	2
26	53	8[illegible]	73	150	75	56	90	7	350	79	1
27		93	78	600	80	39	100	79	250	84 5	1

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TABLE 1 *Data on heat effects June and July 1952* —Continued

Date	Noon					High					
	R H	D B	W B	W V	E T	R H	D B	W B	W V	E T	Patients
July 28	36	97	75	350	81 5	31	101	76	250	84	2
29	33	100	76	250	83 5	33	101	77	150	85	3
30	59	89	77	350	79	50	92	77	150	81 5	6

R H Relati e hum dity
D B Dry bulb t mperature
W B Wet bulb t mperature
W V Wind vel city in f et per minute
E T Effective temperature
Pati nts Number of patients with heat exhaustion r corded
Noon Atmospheric conditi ns at no n
High Atmosph ric condit ons for the h ghest dry bulb temp rature of the day (usually 2 or 3 hours past noon)

Th relativ humidity and t mperatur figures wer taken directly from the Climatology Laboratory records The wind velocity figures wer rounded off because the size of the thermometric chart did not allow for abs lute accuracy Th s di crepency in no way affects the result of the tudy Wh n the E T reached 80 F it was taken to the nearest one half degree for purposes of comparison

there is a range known as the comfort zone In summer the comfort zone extends from an ET of 66 to 75 F and the line of feeling comfortable from an ET of 64 to 79 F In winter the zone extends from an ET of 63 to 71 F and the line of feeling comfortable from an ET of 64 to 74 F This difference is due to the ability of the body to adapt itself within limits, to surrounding conditions The line of feeling comfortable is worthy of further explanation because it is indicative of the number of persons affected In summer it was found that 98 percent of the subjects were comfortable at an ET of 71 F and about 50 percent were comfortable at an ET of from 68 to 75 F Beyond the ET limits of 64 and 79 F ET none of the subjects were comfortable

Although these figures afford a basis for comparison, it is apparent that training activities can be carried on while personnel are uncomfortable for example when the ET is 80 F It is also understood that some people can work when the ET is between 85 and 90 F, but there is a point at which the number of persons affected by heat suddenly increases thus making a training program extremely difficult to conduct. In order to determine the effective temperature for this post study was made of the records for June and July of the 3 atmospheric factors and the number of heat victims treated in the hospital The data included the noon temperature as well as the high for the day in order that a comparison could be made in order to suspend activities before anyone succumbed to the heat

The data in table 1 were secured from recording graphs made by the Climatology Laboratory Quartermaster Board Fort Lee Va From these figures it was possible to find the ET by using the thermometric chart previously referred to (2) The number of persons treated for heat exhaustion was secured from the dispensary reports which are forwarded to the surgeon daily

It is to be expected that a certain number of heat victims will report to the dispensaries when the weather first becomes quite warm during the summer months Troops require a period of acclimatization and it is believed that this is reflected on the graph during the first week in June (fig 1) The ET did not rise above 80 F and therefore it is concluded that these men overexerted themselves without such precautions as water and salt replacement and resting in the shade In the next several weeks the usual number of victims to be expected were reported but on 25 June the high ET of 84 F resulted in 8 patients being recorded Only patients reported at the various dispensaries were recorded We may assume that some patients were treated in the field On 27 June the high ET was 85 5 F and 21 patients were reported In the following weeks up to 21 July there

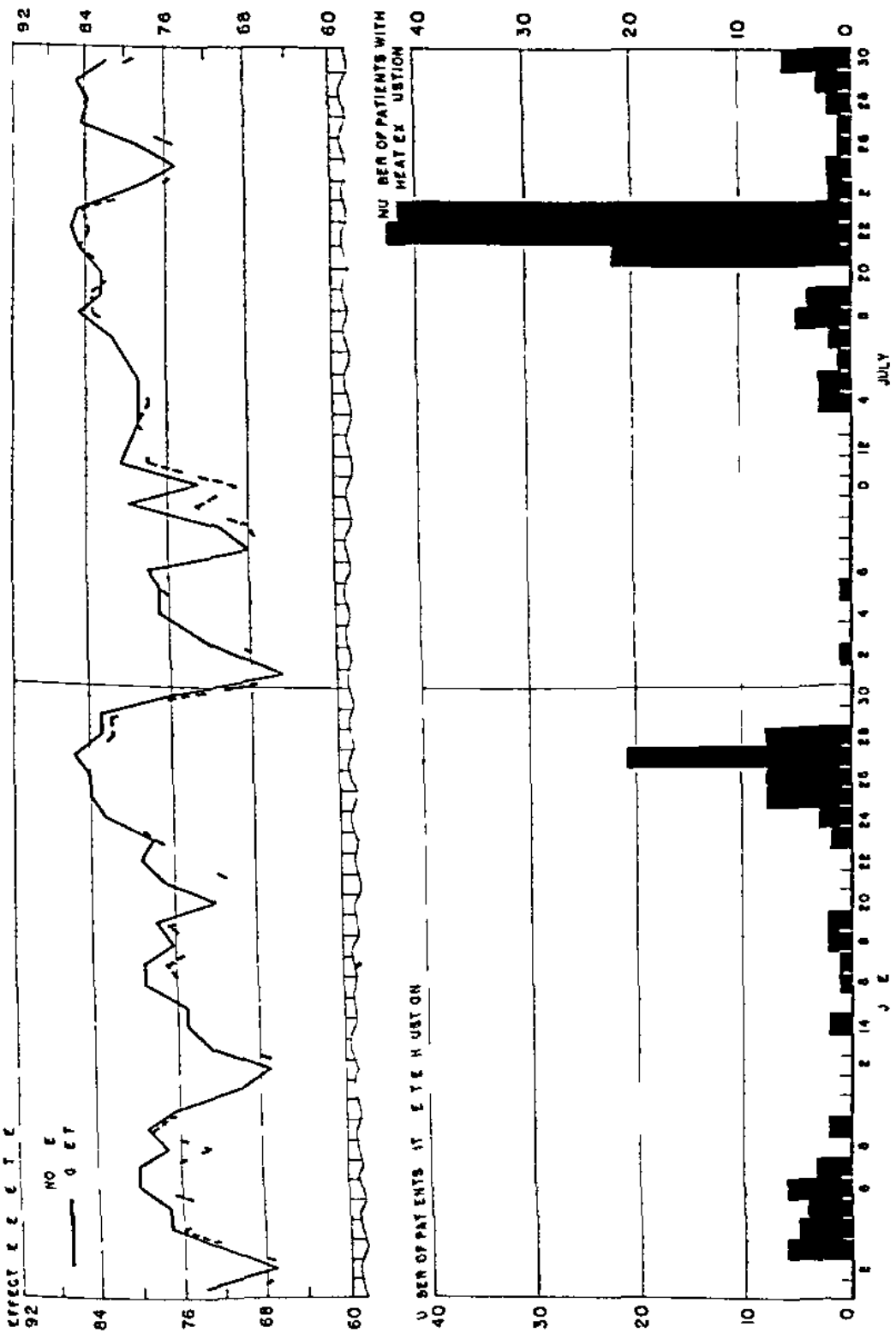


Figure 1 Incidence of heat exhaustion and effective temperature June and July 1952

were a normal number of patients but on 21, 92 and 93 July a large number were reported when the ET reached 84 5 F This study was completed on 24 July and the findings were forwarded to the commanding general of the post On the basis of recommendations arising from these findings training activities were suspended when the ET reached 83 F on 28 and 29 July The low number of patients with heat exhaustion reported on these 2 days of intense heat indicates clearly the effectiveness of the program

The data gathered in June and July appear to indicate a direct relationship between a high ET and the number of heat victims With an ET of 84 F a large number of men will develop heat exhaustion This would not necessarily be the critical ET for all posts because acclimatization of the troops is an important factor that is not considered in the data A post near the equator where the troops are accustomed to hot humid weather would have a higher critical ET and the reverse would be true of a post located in a cold dry region

SUMMARY

A study was made to determine a combination of atmospheric conditions that would result in an abnormal number of heat victims It was found that by using effective temperatures and comparing them with the number of patients with heat exhaustion reported a very satisfactory index of their relationship was developed These findings greatly assisted the surgeon at Fort Lee, Va , in advising his commanding general as to when it was advisable for training operations to cease in order to avoid an unusual incidence of heat prostration and stroke

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BOOKS RECEIVED

P Sens tions nd Rea ti by *J m s D H dy* Ph D As oc t Professes f Phy l gy C rn ll U ty M d l C ll g *H ld G. W ///* M D P f f M dic (N ur l gy) C ell U e s ty Medic l Colleg d *H l Go d ll* B S R e ch F ll w M d cine C rn ll Un rs ty M di l C ll g with f eword by *Ed G. Bo g* Ph D Pr f f P y h l gy H rvard U ers ty 435 pag ill tra ed W ll ms & W lkin Co B lt m Md p bl h s 1952 Pric $6 0

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The Nat onal He lth Service i G t B ita A Hi to l d D s *t*P Study by *J m St l g R* 398 pag ll trat d O fo d U e tty P e N w Y k N Y p bl h r 1952 P c $7

THE ROLE OF THIAMINE HYDROCHLORIDE IN DENTISTRY

Part I (1)

JAMES L. E. BOCK *Lieutenant Colonel U. S. A. F. (DC)* (2)

ALTHOUGH thiamine hydrochloride has been extensively used in numerous medical conditions, the literature is rather obscure regarding its use in dentistry. Primarily, this study deals with the effect of thiamine on painful dental conditions, but its general effects will also be discussed in an attempt to establish its role in dentistry.

In order to have a comprehensive understanding as to the mechanism of action and intelligently to account for the results obtained, a preliminary study of thiamine was made encompassing its chemistry, physiologic functions, body requirements, and the clinical manifestations resulting from a deficiency. The general therapeutic use of thiamine was reviewed. Clinical observations were made of thiamine therapy in various painful dental conditions with particular attention to (1) the extent of relief from pain, (2) the time required for relief, (3) the dose required, and (4) side reactions.

The therapeutic results obtained by using various routes of administration were compared. The pain threshold of normal men and women was studied. The effect of thiamine on the pain threshold in the average normal adult was studied. The pain threshold in patients with painful dental conditions and the effect of thiamine were evaluated. The efficacy of thiamine in the prevention of postoperative pain was determined.

GENERAL CONSIDERATIONS

Historical data. Thiamine is one of the factors of the vitamin B complex. In 1926, Jansen and Donath (3) first isolated thiamine in crystalline form from natural sources. Windaus et al (4) isolated the pure vitamin from yeast and established its empirical

(1) The first of three articles on this subject.

(2) Bolling Air Force Base, Washington, D. C.

(3) Jansen, B. C. P., and Donath, W. F.: Mededeel. Dienst Volksgezondheid Nederl. Indie, 1926, part 1, p. 186.

(4) Windaus, A., Tschesche, R., Ruhkopf, H., Laquer, F., and Schultz, F.: Die Darstellung von krystallisiertem Vitamin aus Hefe. Vorlaufige Mitteilung. Ztschr. f. Physiol. Chem., 204: 123-128, 1932.

formula The name thiamin chloride was suggested by Williams (5) who with Cline (6) had been able to synthesize the vitamin The terminology was accepted by the American Conference on Vitamin Standardization and the Council of Pharmacy and Chemistry of the American Medical Association (5) in 1937 but in 1940 this was replaced by the term thiamine hydrochloride (7) Synonyms are Vitamin B_1, vitamin B_1 hydrochloride and aneurine hydrochloride

The biologic activity of 3 micrograms of crystalline thiamine hydrochloride has been accepted as the standard for the United States Pharmacopoeia unit (8) and the international unit

Description The vitamin is isolated as thiamine hydrochloride and chemically consists of thiazole and pyrimidine (9) It is water soluble and is very unstable in neutral or alkaline solutions but is fairly resistant to heat and oxidation in an acid solution It is stable in a solution with a pH between 3 5 and 5 5 but is less stable in a solution with a pH above 5 5 Commercially it is synthetically prepared for oral administration in scored tablets pulvules and elixirs ranging in concentrations from 1 to 100 mg per cc It is prepared in a solution for parenteral use in concentrations from 10 to 100 mg per cc

Physiology Thiamine has been shown to act in the body as thiamine pyrophosphate (cocarboxylase) Peters and his co workers (10 12) in a long series of experiments studied the phosphorylation of thiamine in animal tissue and found that it acts as a coenzyme playing an important part in carbohydrate metabolism especially in oxidation of pyruvic acid It was also shown to promote oxygen uptake in polyneuritic brain tissue of pigeons in vitro (13) Thus thiamine is concerned with tissue respiration

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(5) Th mi chl r d R ports f th Coun il Pharmacy nd Ch mi try J A M. A. 109 952 Sept 18 1937

(6) Williams R. R d Cl J K. Sy th f t m n B_1 J Am Ch m Soc 58 1504 A g 1936

(7) Annual M g f th C un l Pharmacy nd Ch m stry R port f th Coun il. J A. M. A. 115 133 July 13 1940

(8) Th Pharma poe f th U ted St t f Am r 12th rev Ma k Pr ntg Co Ea P 1942 p 625

(9) W ll m R R Ch mistry of th mi (V tam B_1) J A M A 110 727 732 Ma 5 1938

(10) K nn r l y H W d P ters R A Ca b hydr t m tab l m in b d brain local sat of l ct d v t m B nd t lat t g f ymp B och m. J 24 711 722 1930

(11) Peter R A nd S l tr H. M S nd i ca b hydra metabol f ctor infl ng ma na c of pur t urvl ng bt tis ue f ortal p g B och m J 27 1677 1686 1933

(12) L g C. nd P ter R A Pyr t dat b ev d der d from m tab l sm f K to-butyr cid B h m J 33 759 773 May 1939

(13) P t R A B ch mi l l tami B_1 d f c cy ppl cat o f oder b och mical lys di g i La l 1161 1165 May 23 1936

It was early believed to play a significant role in protein and fat metabolism but, in 1945, Dann *(14)* demonstrated that it may not be essential for protein metabolism by maintaining rats on an 80 percent casein, thiamine-free diet for more than a year The enzyme that is active in protein metabolism contains pyridoxine but not thiamine *(15)*

Evans and Lepkovsky *(16)* showed that the presence of fat always decreased the amount of thiamine necessary and termed this phenomenon as "the sparing action of fat on the antineuritic vitamin " They maintained rats on a diet containing as high as 50 percent fat in the absence of thiamine for as long as 6 months without producing any signs of thiamine deficiency Stirn et al *(17)* demonstrated that when the carbohydrate component of a thiamine-free diet in rats was replaced by fats, the resultant diet alleviated the polyneuritic syndrome Similar results were obtained by other investigators and led Jansen *(15)* to make the assumption that thiamine is not a constituent of any enzyme active in the metabolism of fat. Other investigators *(18 21)* showed that thiamine administered to rats and pigeons on a fat-free, thiamine-deficient diet resulted in an increase in fat production This evidence seems to indicate that thiamine is necessary for the synthesis of fat from carbohydrates but plays no important part in the metabolism of ingested fats Water metabolism appears to be connected with carbohydrate metabolism The exact mechanism is unknown, but edema may be the result of thiamine deficiency This is best demonstrated in the patient suffering from wet beriberi There is much evidence *(22, 23)* that

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(14) Dan W J Effect of thiamine fr high prot i di ts on r ts Fed r ti n Pr c 4 153 1945

(15) Ja s B C. P The Physiology f Th ami I H rr R S nd Thimann K V (editors) Vit min d H rmon s Vol VII Ac d mic Pr ss Inc N w York, N Y 1949 pp 84 110

(16) Ev ns H M. d L pkov ky S Sparing acti n of fat o ntineur t c vit m n B J Biol Ch m 83 269-287 A g 1929

(17) Stir F E Arnold A nd El ehj m C A Relation of di tary f t t th min requir m nt f grow ng rats J N trit on 17 485-495 May 1939

(18) McHenry E W and Ga G B vit min a d f t met bolism eff ct of thia min upon sy th i of body f t in p ge s J Bi l Ch m 128 45-49 Apr 1939

(19) McH nry E W and G n G B v t min and f t metab lism eff ct of thia min ribofl vin and r pol sh co ntr t up n body fat J Bi l Ch m 125 653-660 Oct 1938

(20) B x r G E. nd St tt De Jr Rol of thi mine in ynth si f f tty cid from carbohyd t pr cur or J Bi l Chem 153 607-616 May 1944

(21) Whippl D V a d Chur h C. F Eff ct of vitam n B_1 n r p ratory q ot nt J B ol Ch m 119 CIII 1937

(22) Munz B Coc rb xyl e a d y the of c tylch l Proc Soc Exper Biol & Med 63 280 281 N v 1946

(23) Vo Mur lt A Th mi nd periph f l neurophysi l gy In H rr R S nd Thima k V (dit rs) V tamin nd Horm V l V A d mic Pr s I c New York N Y 1947 pp 93 118

thiamine is important in nerve metabolism Von Muralt *(23)* has proposed that it not only be considered as a catalyst but also as a metabolic substance in nerve biochemistry

Thiamine is said to be essential in obtaining optimal growth in infants and children Brown and Sturtevant *(24)* have reviewed a number of investigations concerning the thiamine requirements for the growth of rats in which sufficient evidence was presented that the vitamin is necessary for optimal growth Dan and Cowgill *(25)*, in studying female albino rats determined that the thiamine requirement for good growth is 3 or 4 times that needed for maintenance Control studies *(26 28)* on growing children showed that those with supplementary thiamine in the diet made a substantially greater weight gain than was made by children receiving ordinary diets

In the role of carbohydrate metabolism the principal function of thiamine is to oxidate pyruvic acid which is an intermediary metabolic product. Therefore a deficiency of thiamine allows an accumulation of pyruvic acid Patients with beriberi have been found to have high levels of pyruvic acid in their blood urine and tissues *(29)* The accumulation of pyruvic acid in the brain seems to be directly associated with the appearance of nervous symptoms in thiamine deficiency *(30)* There is some evidence that thiamine is involved with the synthesis of glycogen from glucose and plays an important part in muscular activity Lu and Platt *(31)* suggested that excessive muscular work may be responsible for the development of vitamin B_1 deficiency Values for pyruvic acid as high as those in fulminating beriberi were obtained after exercise of thiamine deficient subjects Similar high values were obtained in subjects that were normal

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(24) B w R A d Stur t M V m q m t f gr w ng t I H R S. d Th ma k V (d t) V tam d H m V l VII A d P I c N w Yo k, N Y 1949 pp 171 199

(25) Dann M. nd C wg ll G R V tam requir m t f f m l lb r t f n t na d gr wth Am J Phy l 109 27 28 July 1934

(26) M g A F nd B rry M M U d rw ght h ldr c ed gr wth ured thr gh us f wheat g m Am J D Ch ld 39 935-947 May 1930

(27) S mm feld P V l f d pply f m B_1 d ir d t of ch ld Am J D Ch ld 43 284 290 F b 1932

(28) R J R. d Summ f ld P V l f ea d pply f tam B_1 nd ir d et f h ldr Am J D Ch ld 49 1185 1188 May 1935

(29) Pl tt B S d L G D Stud m tab l m f pyr d orm l d t m B_1-d f c t tat umul t f pyruv d nd th r carb yl c poun- be -beri d ff t f tam B_1 B och m J 33 1525 1537 Oct 1939

(30) Och S Coca b xyl I E E A J (ed tor) Th B l g cal Action f th V tam ns Symp um U ty f Ch g P Ch cag Ill. 1942 pp 17 38

(31) L G D d Platt B S Stud m tab l m f pyruv c d in orm l a- tam B_1-d f t t t ff f blood pyr t tam B_1 d f cy ma B och m. J 33 1538 1543 Oct 1939

in vitamin B_1 after exercising until exhausted These subjects returned to normal after 1 hour In subjects with vitamin B_1 deficiency there was delayed recovery after high values were obtained following exercise

Tissue distribution Absorption of thiamine in the intestine takes place by simple diffusion *(32)* and is confined largely to the small intestine *(33)*, very little taking place in the large intestine *(34)* Thiamine is present in the body as free thiamine, thiamine pyrophosphate, and both in combination with proteins *(35)* The free thiamine circulates in the blood plasma and in the cerebrospinal fluid and the thiamine pyrophosphate is confined to the red blood cells, 90 percent of the total vitamin B_1 in the blood is in the pyrophosphate form, ranging in values from 4 5 to 12 micrograms per 100 ml of blood Sinclair *(36)* found values ranging from 5 5 to 10 5 micrograms per 100 ml of blood and stated that a value of 4 5 or less can be considered as abnormally low Ochoa and Peters *(37)* found that the brain skeletal muscle, liver, and heart of rats and pigeons contained much more thiamine pyrophosphate than thiamine About 70 percent of the total thiamine in muscle and heart was in the form of thiamine pyrophosphate and little or no free thiamine was found in the brain and liver Williams *(38)* gave similar proportionate values for human tissues Goodhart and Sinclair *(35)* stated that not only nucleated red blood cells but, probably, all nucleated animal cells have the power to phosphorylate thiamine because thiamine pyrophosphate is confined to the blood cells, it seems probable that thiamine is carried to the tissues and organs by the blood plasma in the free form where phosphorylation takes place The conversion of thiamine into cocarboxylase appears to take place largely in the liver *(37)* Dephosphorylation takes place in the kidney and the vitamin is excreted in the free form *(30)* Cocarboxylase is not normally found in the urine *(39)*

(32) Stockholm, M Althausen T L and Bor on H J Mechanism of intestinal absorption of thiamin Proc Soc Exper Biol & Med 46 387 390 Mar 1941

(33) Friedemann T E Kmieciak, T C Keeg n P K and Sheft B B Absorption destruction, and excretion of orally administered thiamin by human subjects Gastroenterology 11 100-114 July 1948

(34) Najja, V A and Holt L E Jr Biosynthesis of thiamine in man and its implications in human nutrition J A M A 123 683-684 Nov 13 1943

(35) Goodhart R S and Sinclair H M Estimation of cocarboxylase (vitamin B_1 diphosphate ester) in blood Biochem J 33 1099 1108 July 1939

(36) Sinclair H M Estimation of Vitamin B_1 in blood further modification of Merkle-Cohn method Biochem J 33 2027 2036 Dec 1939

(37) Ochoa S and Peters R A Vitamin B_1 and cocarboxylase in animal tissues Biochem J 32 1501 1515 Sept 1938

(38) Williams R J Significance of vitamin content of tissues In Harris R S and Thimann, K V (editors) Vitamins and Hormones Vol 1 Academic Press Inc New York, N Y 1943 pp 229-247

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(24) Br w R A d S urt t M V m r q m t f gr w ng t In Ha R S. d Th ma n K V (d o) V m d H m V l VII A d mic P I N w Y rk N Y 1949 pp 171 199

(25) Dann M. d C wg ll G R V tami q t m f f mal lb t t for ma r t na d gr wth Am J Phys l 109 27 28 J ly 1934

(26) M g A. F nd B ry M M U d rw ght h ldr increa ed growth ved hr gh us f wheat g m Am J D Ch ld 39 935-947 May 1930

(27) S mm f ld P V l f d pply f t m B nd ir d t of h ld Am J D Ch ld 43 284 290 F b 1932

(28) R J R nd S mm f ldt P V l f t r d pply f itami B_1 nd ir d et f h ldr n Am J D Ch ld 49 1185 1188 May 1935

(29) Pl tt B S d L G D Stud n m tab l m f py c d ormal and m B_1-d f t tat c mul t n f pyruvic c d nd other ca b yl poun. n be i-bet d ff t f tam n B_1 B och m J 33 1525 1537 Oct 1939

(30) Och S Coca b xyl In E E A J (d tor) Th B l g cal Actio f th V tam Sympo ium U ty f Ch c g P Ch cag Ill. 1942 pp 17 38

(31) L G D d Platt B S Studi m tab lism f pyruv c d in ormal a. itamin B_1-d f t t s ffe t f blood pyr v t i tam B_1 d f ncy n ma B och m. J 33 1538 1543 O 1939

mum requirement was 0 23 mg per 1,000 calories of ingested food Stare et al (47) found that estimated requirements varied from 0 13 to 0 5 mg per 1,000 calories of ingested food These figures were based on normal, healthy persons and did not take into account the various factors other than caloric intake that might influence the requirements of thiamine

Factors affecting body requirements The B M R is a most significant factor inasmuch as an increase of the metabolic rate increases the thiamine requirement Patients with febrile diseases (48) hyperthyroidism (49) increased muscular activity (31), or pregnancy and lactation (50) require an increased amount of thiamine Williams and Mason (51), in experiments in which patients were maintained on thiamine-deficient diets, observed a decrease in the B M R of from 10 to 35 percent from previous normal rates noted before the deficient diet was started

The type of diet consumed is another significant factor Because thiamine is essential in the metabolism of carbohydrates, it can readily be appreciated that the amount of carbohydrate ingested would influence the amount of thiamine required Thus, if a person were sustained on a relatively low carbohydrate diet, the amount of thiamine required would be less than if he were taking a high carbohydrate diet

Age may be an influencing factor The child requires an increased amount of thiamine for optimal growth (26-28) Kirk and Chieffi (52) in determining fasting levels of thiamine in the blood of 220 patients between 40 and 102 years of age, noticed a lowering of thiamine levels with increasing age Blanchard and Cameron (53) reported a decrease in thiamine excretion with increased age In both of these observations, the blood thiamine did not vary with increased age This seems to indicate that the basal metabolism decreases as the age increased

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(48) Foltz E E and Frost T Thiamine requirement of man Proc Soc Exper Biol & Med 57 1944

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(53) Blanchard A C and Cameron E P Studies on thiamine metabolism I Excretion of thiamine and its metabolites in normal individuals of various ages J Nutrition 6 1933

been attributed to thiamine deficiency *(67 69)* Weisberger *(0)* described small pinpoint vesicles occurring on the buccal mucosa, under the tongue or on the palate and similar to herpetic lesions as being characteristic of thiamine deficiency but most investigators attribute such lesions to a virus and not to thiamine deficiency Some precancerous mouth lesions including leukoplakia have been linked to a deficiency of vitamin B *(71)* Neuralgia and postoperative pain following dental extractions and other dental operations have been reported as being relieved with the administration of thiamine *(7 73)* but the possible etiologic factor of thiamine deficiency has not been discussed in these conditions

The value of recognizing symptoms of thiamine deficiency in dental patients cannot be overemphasized because their elimination with adequate vitamin therapy may make the difference between successful and unsuccessful treatment

Causes of deficiency The cause of thiamine deficiency is fundamentally nutritional in nature and may be brought about by (1) inadequate intake of thiamine (2) inadequate absorption of thiamine (3) increased requirement of thiamine, and (4) excessive loss of thiamine

1 Inadequate intake of thiamine may result from the ingestion of an insufficient quantity of food through (a) ignorance of proper standards of nutrition (b) adherence to certain reducing diets (c) chronic alcoholism in which the patient substitutes alcohol for food (d) critical illness (e) the necessity for intravenous feeding following operation, (f) immobilization of the jaw following fracture or (g) inability to masticate food properly because of complete absence of teeth insufficient masticating teeth or new or poorly fitting dentures

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(67) B k H Krem M. Y d W gg C. G K l f f ympt ms f major ur g minal ur lg (t doul ur ux) f ll w g us f mi B_1 d entra d l xtr J A M A. 114 1421 1423 Ap 13 1940 ort 114 1942 day 11 1940

(68) Kala L Ube d V amin B_1 d Th p d N ur den und Neur lg en Act m d. Sca din 107 427 498 1941

(69) L J (Bueno Aire) La tami B (tiam na) en l tratam e d la paral f l pe fer ca Dia m d 11 822 825 S pt 4 1939

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(73) Math H. V tami B_1 ur B kampfung d s Dolor po t tractu m und derer Schmerzzust nd fur da Rüstzeug d S mat log (la f gu Mitt ilung) Zsch f St ma l 46 201 202 May 1949

2 Inadequate absorption of thiamine may result from (a) prolonged diarrhea (74) (b) excessive vomiting as in pregnancy (75), (c) the neutralization of thiamine by general alkalosis or by alkaline intestinal contents as associated with excessive use of antacids, achlorhydria, and the giving of alkaline powders to patients with peptic ulcer, (d) diseases and functional disorders of the liver (44) (e) diuresis as a result of excessive amounts of fluid ingested as seen in a forced-fluid regimen for certain patients (76) and (f) inhibition of the synthesis of thiamine in the intestine in the presence of sulfonamides (3, 77, 78) and some antibiotics (aureomycin and chloramphenicol) (79).

3 Increased requirements because of increased metabolism may be associated with (a) an increase in carbohydrate ingestion, (b) vigorous muscular activity, (c) febrile diseases, (d) hyperthyroidism, (e) pregnancy and lactation, (f) extreme changes in climatic conditions, (g) the intravenous administration of dextrose, and (h) general anesthesia (80, 81).

4 Excessive loss of thiamine may be associated with (a) irritation of the facial nerve by exposure of the face to cold which results in Bell's palsy, (b) facial paralysis due to trauma or surgical injury, (c) lacerations and traumatic injuries of soft tissues (82) (d) trauma produced by dental extractions and other surgical operations, (e) fractures, (f) severe burns (83), (g)

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(81) Blalock, A. Traumatic shock. In Christopher, F. (editor): Textbook of Surgery. 5th edition. W. B. Saunders Co., Philadelphia, Pa., 1945, pp. 1464-1468.

(82) Gover, W. M. and Greer, M. E. Studies on shock induced by hemorrhage; effect of cellular damage on in vitro hydrolysis and synthesis of cocarboxylase by liver tissue. J. Pharmacol. & Exper. Therap. 79: 240-245 Nov. 1943.

(83) Lund, C. C., Levenson, S. M., Green, R. W., Paige, R. W., Robinson, P. E., Adams, M. A., MacDonald, A. H., Taylor, F. H. L. and Johnson, R. E. Ascorbic acid, thiamine, riboflavin and nicotinic acid; a relation to burns in man. Arch. Surg. 55: 557-583 Nov. 1947.

neuromas due to dental extraction (h) neuralgias and painful symptoms due to amputations *(84)* (i) local infections (j) diarrhea *(74)* (k) loss of the coenzyme necessary for normal tissue respiration due to hemorrhage and shock *(80 82 85 86)* and (l) diuresis *(76)*

GENERAL THERAPEUTIC USE OF THIAMINE

Of major importance in the therapeutic use of thiamine is its effect on the central and peripheral nervous system Symptoms resulting from thiamine deficiency include mental depression vague aches and pains insomnia nervousness and apprehension loss of memory ataxia, peripheral neuritis, neuralgia and irreversible degenerative changes

Peripheral nervous system

Polyneuritis or peripheral neuritis may be localized or generalized *(87)* The primary causes of generalized neuritis are viruses bacterial toxins dietary deficiency improper metabolism and chemical poisons Local neuritis may be from mechanical and infectious causes Thiamine deficiency may play a major role in the development of many types of neuritis *(87 91)* The beneficial results of the therapeutic use of thiamine for neuritis seem to indicate that in many instances thiamine deficiency may be either a primary or a secondary factor in its development The polyneuritis associated with beriberi alcoholism pregnancy pellagra cachexia hyperthyroidism chronic diarrheal diseases and postinfectious diseases are usually a manifestation of thiamine deficiency and differ only in the mechanism by which they are brought about *(88 89)*

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(84) Sl b g A. L T t m t d lg d mp pa l tami B_1 yn he que P m d 47 1589-1591 D 6–9 1939

(85) Go W M d G C. M St d hock d d by h mor hag ff t f th m ur l m J Pha mac l & E p Th p 77 317 320 A g 1941

(86) R H J A. L g C. N H d W lb lmi A E B h m c l tud s on hock oxyg un p on f l er d k d y f m r t h m rrhag ho k J E pe M d 79 23 33 J 1944

(87) Ar g C. D E J P d Sp T D Som l l ur l g p ct f tami B d f J A M. A 113 2105-2110 D 9 1939

(88) St M. B Ther p t f tam B_1 polyn ur t d cardiov cal co d t l cal d ea In Th V tam A Sympo m Ar g d U d th A p f th C l Pharma y d Ch m s y d h C un il F od f h Am r an M d cal A n. Am M d l A t Ch g Ill 1939 pp 193-202

(89) J ll ff N T m t f ur p y h tr d ord w th tam J A M A. 117 1496-1500 N 1 1941

(90) S E L f tra p nal (ba ch d) j ct f tam B_1 f l f f tam tr ct bl pa d for infl mmat ry d d g t d ea e f entr l rv y tem pr liminary epor Am J Surg 39 495-511 Ma 1938.

(91) S pp W O., K hna J d Schroed H V tamins d Th Cl c l Appli cat (T l t d by Bouman, H A H) V tami P oduct Co Milwauk W 1938.

Neuritis due to dietary deficiency is usually limited to the extremities Although Cabot and Adams (92) state that the cranial nerves are rarely involved, a significant percent of neuritides due to dietary deficiency in which the cranial nerves are affected have been reported (93 94 95) Such cases have been attributed to a thiamine deficiency The fact that cranial nerves can be affected by dietary deficiency is therefore important to the dentist It is likely that in the past many cases of facial pain from this cause have gone unrecognized The dentist must, therefore, have a better understanding of the systemic conditions commonly associated with thiamine deficiency and peripheral neuritis

1 *Beriberi* is characterized clinically by degenerative changes in the nervous system, including a multiple peripheral neuritis which may exist alone but is often combined with generalized edema and serous effusions, and by a tendency to the development of cardiac hypertrophy which frequently results in cardiac failure and sudden death (96) The treatment of acute beriberi consists of the immediate administration of large doses of thiamine supplemented by vitamin B complex

2 *Alcoholic polyneuritis*, once thought to be due to the toxic effect of alcohol, is now generally believed to be due to thiamine deficiency Alcohol has no direct toxic action on peripheral nerves (96) Jolliffe et al (96) have demonstrated in their studies on alcoholics that even when large amounts of whisky were ingested, polyneuritis did not develop if thiamine were given concurrently They also observed that polyneuritis may develop within from 7 to 21 days in alcoholics deficient in thiamine

3 *The polyneuritis of pregnancy* was regarded in the past as the result of toxemia but more recently has been attributed to a vitamin deficiency (97) Severe polyneuritis is usually preceded by pernicious vomiting in early pregnancy (75) The thiamine deficiency is brought about by a reduced food intake, lack of

(92) Cabot R. C. and Adams P D Cabot and Adams Physical Diagnosis William Wood & C Baltimore Md 1942 p 808

(93) Lewy F H Spies T D and Arring C. D Incidence of neuropathy in pellagra; effect of cocarboxylase upon its neurological signs Am J M Sc 199 840 849 June 1940

(94) de Grazia S Retrobulbar neuritis due to malnutrition (nutritional amblyopia) Ophthalmologica 118 764 774 Oct Nov 1949

(95) Gottlieb B (London) Vitamin B complex deficiency as cause of retrobulbar neuritis and peripheral neuritis in a chronic alcoholic and pipe smoker Brit J Ophth 25 556 564 Dec 1941

(96) Jolliffe N Colbert C. N and Joliffe P M Observations on etiologic relationship of vitamin B (B_1) to polyneuritis in alcoholic addict Am J M Sc 191 515 526 Apr 1936.

(97) King A. B. N urological complications occurring as complications of pregnancy Arch. Neurol & Psychiat 63 471 499 Mar 611-644 Apr 1950

retention of food and the increased requirements of thiamine due to the high carbohydrate diet supplemented by large amounts of dextrose which is given to combat the pernicious vomiting Siddall and Mull *(98)* found lowered amounts of thiamine hydrochloride in the urine in patients with multiple pregnancy who had poor appetite and prolonged vomiting The pregnant woman s requirement for thiamine is 3 times that of a nonpregnant woman *(50)*

4 *Diabetic neuritis* The necessity of thiamine in carbohydrate metabolism has in the past stimulated its use in the treatment of diabetes mellitus with beneficial results in some cases *(89)* Other investigators however have failed to observe any beneficial results except for the relief of diabetic neuritis *(99-10)* Diabetic neuritis may be a generalized neuralgic disturbance involving the entire nervous system with a predilection for the peripheral nerves *(99)* The disturbed metabolism in diabetes may further a vitamin deficiency even in patients with well controlled diabetes Oral lesions associated with diabetic neuritis such as red beefy tongue smooth tongue and cheilosis have disappeared with parenteral injections of thiamine and oral administration of yeast Rudy *(100)* concluded that the chronic and severer manifestations of diabetic neuropathy demand intensive and prolonged therapy consisting of large doses of thiamine supplemented by vitamin B complex

5 *Chemical neuritis* Arino et al *(87)* found *no* conclusive evidence that thiamine played a major role in the development of chemical neuritides Sexton and Gowdey *(103)* found a close similarity between the neurologic manifestations and the effect on carbohydrate metabolism of arsenic poisoning and thiamine deficiency They suggested that arsenic inactivates thiamine through interference with cellular function by combining with the enzyme proteins The neurologic symptoms of arsenic poisoning are markedly improved by giving large doses of thiamine An unusual case of neuritis of the masticatory branches of the trigeminal nerve which was secondary to arsenic poisoning has been reported *(104)*

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(98) Sid ll A C d A ll J W Thiam tatus dur g p gnan cy Am J Ob t. & Gy 49 May 1945

(99) R y A Ep S. H R w f 100 f d be ur pa hy f l lowed f om J Cl Endoc 1 5 92-98 F b 1945

(100) R dy A ur pa hy N w E gla d J Med 233 684-689 D 1945

(101) T ott d Bord n, C. U f m B_1 d b m llut l cal udy Am J D ge t 8 1 2 J 1941

(102) Ow L l Rock n, S S., d B w E G E luat on f m B ber py f diabete A h l Med. 66 679-687 S p 1940

(103) Sext G. B d Gowdey C. W R lat on b tw n thi m d enc l t y pr l m ar or Ar h De mat & Syph. 56 634-647 N 1947

(104) F edman, A d Cl C. W Ci d in foo t f nc (64l. p 355-

Many of the side effects noted during administration of the chloramphenicol therapy are caused by interference with the biochemical processes involved in vitamin B metabolism. Dewan and Fitzhugh (*104*) reported the occurrence of peripheral neuritis optic atrophy and severe gastrointestinal bleeding following medication with these drugs. It is not known whether these disturbances were due to the destruction of the intestinal bacteria essential for thiamine synthesis or whether the drugs exerted a competitive blocking of intracellular metabolism which resulted in a thiamine deficiency. Beneficial results have also been reported from the treatment with thiamine of neuritides due to lead and sulfanilamide (*105*).

6. *Neuritis due to pernicious anemia* is thought to be caused by a thiamine deficiency which is secondarily augmented by coexisting nutritional disorders (*91*) and is relieved by thiamine administration in patients in whom liver preparations had corrected the anemia, but not the cord symptoms. Williams and Mason (*91*) in studies on induced thiamine deficiency, observed 5 patients with anemia whose erythrocyte counts were between 3,000,000 and 3,500,000 and who were not relieved by the administration of iron, copper, and protein or riboflavin, choline, nicotinic acid, pyridoxine, and pantothenic acid. The hemogram revealed improvement only when thiamine hydrochloride was administered. Another group (*106*) observed improvement of the neural manifestations which persisted after antipernicious anemia therapy when thiamine was given.

7. *Pellagral neuritis*. There is much evidence that there is an interrelationship between the various vitamins. McLester (*107*) believed the peripheral neuritis occurring in pellagrins to be due to a thiamine deficiency rather than a deficiency of nicotinic acid. He found that nicotinic acid would relieve the psychic and gastrointestinal symptoms of pellagra but that thiamine is required for relief of the neuritis. Spies and Aring (*108*) observed similar results. Sure (*109*), in experiments on rats, observed that chronic thiamine deficiency produces great losses of riboflavin in urine and lowers the retention of riboflavin in the blood. The mobilization of riboflavin in the liver during digestion and assimilation by thiamine depleted animals is relatively slight. Thiamine replenishment of depleted tissues by oral feedings brings about

(*105*) Abstract. Nervous complications of sulfanilamide therapy. Lancet 241: 162 Aug. 1941.

(*106*) Zillhardt, J. C., MacLean, K., and Murphy, W. P. Effect of thiamin on residual neural disturbances of treated pernicious anemia. Am. J. Med. 15: 33-43, July 1941.

(*107*) McLester, J. S. Bodily state of nutrition (Deficiency Co-operation). J. A. M. A. 112: 2110-2114, May 27, 1939.

(*108*) Spies, T. D., and Aring, C. D. Effect of vitamin B_1 on peripheral neuritis of pellagra. J. A. M. A. 110: 1081-1084, Apr. 2, 1938.

(*109*) Sure, B. Vitamin interrelationship. influence of optimum dose of thiamine on urinary excretion of riboflavin. J. Nutrition 27: 447-452, Jun. 1944.

a restriction of the riboflavin mobilizing function Ferrebee and Weissman *(110)* on the other hand did not observe an increase in riboflavin excretion in the early stages of thiamine deficiency but did in the later stages when the thiamine requirement can be satisfied only by loss of the vitamin from the tissues Deficiencies of pyridoxine pantothenic acid and biotin do not influence the concentration of thiamine or riboflavin in the liver *(111)* These findings indicate that thiamine should be administered to all pellagrins in addition to riboflavin to assure the retention and utilization of riboflavin and to relieve the neuritic symptoms

Central nervous system

1 *Changes in behavior* There is both clinical and experimental evidence that thiamine deficiency leads to numerous disturbances of the central nervous system A group of women with a diet deficient in thiamine were found to undergo changes of behavior and showed other psychoneurotic symptoms *(51)* They became depressed irritable quarrelsome fearful confused in thought uncertain in memory and lacking in their usual manual dexterity Headache backache dysmenorrhea soreness of muscles gastric distress tenseness paresthesia, intolerance to noise and increased sensitivity to painful stimuli were frequent complaints All of these symptoms disappeared when thiamine was administered. Rosenbaum and Bradley *(62)* reported 3 patients in whom insomnia nervousness restlessness dizziness headache and apprehension were improved by giving thiamine Harrell *(112)* conducted a 2 year experiment on a group of school children in which he observed an increase in the mental ability in those who received a daily dose of 2 mg of thiamine over that of the group who received no supplementary thiamine

2 *Cancer cachexia* The general debilitation of the cancer patient particularly in the advanced stages, is thought to be due to a vitamin deficiency Such symptoms as mental depression anorexia weakness and nervousness are relieved by the use of thiamine Martin and Koop *(71)* noted that the histories of most patients with oral cancer showed a deficient diet and that a large percent of patients with both intraoral cancer and precancerous lesions showed beneficial results from the administration of vitamin B Stern *(90)* treated 10 patients with inoperable cancer with intraspinal injections of thiamine and noted marked improvement.

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(110) Fer be J W nd W sma N Ribofla n d th m rr I h p ra d ma J N tr 26 459-469 N 1943

(111) M ln k D d O B L. Phys l g l l b l ty f tam ln Har R. S d Th ma K V (d t) V tam d H tm V l V A d m Pr I N w Y k N Y 1947 pp 39-92

(112) H ll R F M l pons t dd d thiamı J N tr 31 283 295 M 1946

All felt better, appetites increased, pain was lessened or abol ished completely, muscular control improved eech nd _ it improved, and joints became more limber

3 *Radiation sickness* in cancer patients a o - t r thought to be due to the toxic effect of the o.o e the field of exposure It is now believed to be du e w deficiency and only aggravated by radiation the possible that radiation interferes with cellular e ab results in such vitamin-deficiency symptom n depression, and anorexia These symptom n giving adequate doses of thiamine prior to ra i t administration of thiamine is indicated once the appeared

BOOK REVIEWS

Progress in Fundamental Medicine by *Paul Carnon*, University of Ch ago *J A. Cunningham*, University of Alabama *Paul Klemperer* Mount Sinai Hospital N Y *Albert Kligman*, University of Pennsylvania *G K. Mallory* The Mallory Institute *Tracy B Mallory* (Deceased) Massachusetts General Hospital *J C. Paterson* University of Western Ontario *L. B. Stoddard* University of Kansas *W Kenneth Cuyle* Duke University and *J P W t* St Louis University *J F A Mc Manus* (Editor) University of Virginia 316 pages illustrated Lea & Febiger Philadelphia Pa pu 1952 Price $9

Each of the 9 chapters of th s o k is a review of the recent literature and a discussion by an authority usually a pathologist, who has performed research work in the topic considered They are (1) "Recent Advances in Parenteral Nutrition with Particular Reference to Protein Hydrolysates," (2) "Melanotic Tumors of the Skin," (3) "Pathology of Systemic Lupus Erythematosus, (4) "The Diagnosis of Fungus Infections with Particular Reference to Staining Methods, (5) The Liver (6) "A Survey of Techniques for the Histochemical Approach to Pathology," (7) "Coronary Artery Disease," (8) "The Problem of Carcinoma in Situ with Reference to the Human Cervix Uteri" "The Recognition of Carcinoma in Situ of the Cervix Uteri by Papanicolaou Method," and (9) "Non Silica Pneumonoconioses" At the end of each chapter there is an excellent bibliography

The chapters on melanoma lupus erythematosus the histochemical approach to pathology, and the discussion of enzymes, coronary artery disease, and nonsilica pneumonoconioses are

a restriction of the riboflavin mobilizing function. Ferrebee and Weissman *(110)* on the other hand did not observe an increase in riboflavin excretion in the early stages of thiamine deficiency but did in the later stages when the thiamine requirement can be satisfied only by loss of the vitamin from the tissues Deficiencies of pyridoxine pantothenic acid and biotin do not influence the concentration of thiamine or riboflavin in the liver *(111)* These findings indicate that thiamine should be administered to all pellagrins in addition to riboflavin to assure the retention and utilization of riboflavin and to relieve the neuritic symptoms

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(110) Fer be J W nd W ma N R bofla d th min rr l sh r t d ma J N rr t 26 459-469 N 1943

(111) Mel k D d O t B L. Phy l g l labil y f tam In H m R S d Th ma K V (d t) V tam d H m V l V A dem P I c N w Y k N Y 1947 pp 39-92

(112) H ll R F M t l pons t dd d thiami J N rr u 31 283 295 M 1946

HYDROCORTISONE IN RHEUMATOID ARTHRITIS

WILBUP C. BEPRY *Colonel, MC, U S A (1)*

JOHN F BENSON *Captain MC, U S A*

RELIEF of pain by intra-articular injections into weight-bearing joints is an important factor in the treatment of rheumatoid arthritis because it enables the patient to become ambulatory, improves his morale, gives him the impression that the doctor has definitely done something for him (thereby making him receptive rather than apathetic to treatment), and helps him to engage more actively in the physical medicine regimen Early ambulation of the patient with acute rheumatoid arthritis is essential in reducing muscular atrophy, contracture of joints, loss of weight, demineralization of bone, and other complications of prolonged bed rest The work of Stevenson et al *(2)*, Freyberg et al *(3)*, and Hollander et al *(4)* prompted us to make the following study of 17 patients with rheumatoid arthritis to evaluate the efficacy of intra-articular injections of hydrocortisone and attempt to apply its use to military medicine

METHOD

A solution containing 25 mg. of hydrocortisone acetate per cc was used The joints were prepared by first shaving the overlying skin, washing the skin with tincture of green soap, removing the soap with ether, and applying alcohol The skin and underlying tissues were infiltrated with 1 percent procaine solution The synovial fluid of the knee joint was aspirated with a 20 gage needle through the medial subpatellar approach and the ankle joint bursa was aspirated through an approach anterior to either the medial or lateral malleolus All available fluid was aspirated The syringe used for aspirating was removed from the needle which was left in place 25 mg. of hydrocortisone was injected into the knee joints and 15 mg. into the ankle joints All aspirated

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(1) Medical Service Army and Navy Hospital Hot Springs Ark

(2) Stevenson C R Zuckner J and Freyberg R H Intra-articular hydrocortisone (compound F) certain preliminary report Ann. Rheumat. Dis 11 112 118, June 1952

(3) Freyberg R H Pearson M. Adams C. H., Duryag J and Traeger C. H Practical considerations of use of cortisone and ACTH in rheumatoid arthritis Ann Rheumat Dis 10 1 15 Mar 1951

(4) Hollander J L Brown E M. Jr Jessar R. A and Brown C Y Hydrocortisone and cortisone injected into arthritic joints J A. M. A 147 1629-1634 Dec 29 1951

TABLE 1 *S mmary / s lts /*

P	J	S ty(3)	A tag mp m t (p t t)		Inj ns f hydr t (2)		D y (4)	I val (5)
			S b	Ob	Numb	T l (mg)		
1	L f k	++	90	0	7	175	41	7
2	L ft k		100	0	1	25	1	
	R ght k		80	0	7	175	41	7
3	R gh k		90	20	6	150	41	8 2
4	L f k	++	90	50	2	50	5	5
	L ft kn	+	90	50	5	125	44	11
5	R gh k	+++	80	60	2	50	9	9
6	L ft k		10	0	2	50	5	5
	R ght k	+++	80	50	2	50		35
7	L f k	+ +	80	50	3	75	43	21 5
	R ght k	++++	50	30	7	175	50	7
8	L ft kn	+++	50	30	7	175	50	7
9	R gh k		100	80	2	50	5	5
10	R gh k	++	100	50	2	50	5	5
11	R ght k		0	0	2	50	5	5
12	R gh k		80	50	1	25	1	
13	R ght k	++++	80	20	2	50	7	7
	R gh kl		50	50	1	15	1	
14	L ft kl	++	50	50	1	15	1	
15	L ft k	+	80	80	3	75	24	12
16	L ft kl	+++	0	0	1	15	1	
	L ft nkl	++	0	0	1	15	1	
17	R gh nkl	+	80	0	1	15	1	

(1) All m p pat 8
(2) 25 mg k 15 mg kl
(3) B f t tm t
(4) P od f tr m t
(5) A t g day b tw j t
(6) Wh l t h k d

treatment with hydrocortisone(1)

Joint fluid cytology

Before treatment		After treatment		Remarks
WBC	PMN	WBC	PMN	
1,800	53	5 450	65	Swelling and pain returned 24th day of treatment, then remained.
120	4			Soreness and aching returned for 40 days after treatment (6)
430	80	120	44	Swelling and pain returned on 6th day of treatment
4 050	71	2,350	42	Complaints returned 30 days after treatment; synovial thickening decreased.
Ag		1 700	66	Slow improvement in objective signs; subjective relief maintained.
9,350	82	7 0	62	Out of bed in 4 days; slight swelling on 27th day after treatment; no return of fluid following aspiration and treatment.
13 500	85	NF	-	
1,260	68	NF		No objective or subjective response
2 150	80	1 700	84	Re-treatment necessary after 5 days.
3 000	96	1 970	83	Minor chronic joint signs and symptoms 30 days after treatment.
3 100	74	NF		Chronic rheumatoid arthritis with deformity returned weekly for injections
1,300	96	1,250	70	Relief lasted about 6 days.
1,200	66	BI		Marked subjective relief for 30 days (6)
		1,250	60	Marked subjective relief for 30 days (6)
100	2	3,600	40	Chronic arthritis with contracture; no response
5 500	68			Joint overflowing fluid developed; improvement maintained.
3 465	65	NF		Marked relief; increased ability to walk
NF				Relief; patient able to walk; improvement maintained
NF				
1 650	32	900	39	Fluid returned at 14 days; third injection; remission maintained for 30 days (6)
NF				Joint more painful on day following treatment
NF				No response
5 500	61			Excellent subjective relief for 5 days

Sub = Subject
Ob = Object
WBC = leukocyte
PMN = polymorphonuclear leucocytes
NF = no fluid
Hl = Hemolyzed
Ag = aggregated

synovial fluid was sent to the laboratory within 1 hour where it was cultured and total and differential leukocyte counts were made The schedule for injections was determined solely by the time it took for significant joint pain to return

RESULTS

Sixty-eight injections were made into 23 joints The results are shown in table 1 which follows the form used by Stevenson et al (2) to facilitate comparison Our results were similar to those previously reported (2 4) Subjective improvement included relief of pain and stiffness ability to sleep better, reduced requirement for analgesic drugs and ability to walk with less or no pain This varied in degree and duration Four joints showed little or no (0 to 10 percent) 4 moderate (30 to 70 percent) and 15, marked (80 to 100 percent) subjective improvement In general the relief lasted from 2 to 7 days Occasionally there were longer periods of relief Four patients were promptly relieved subjectively, and remained so for 30 days after receiving only 1 or 2 injections *Which type of joint involvement would respond best* was not determined but in general the most promising results were obtained in the acute painful joints with fluid and the poorest results were observed in the chronic, mildly painful joints with thick boggy synovia

Objective improvement consisted of a decrease in fluid swelling and tenderness and was observed in 15 of the 23 joints treated There was a significant decrease in the synovial cell count in 7 knee joints after treatment Five joints all of which contained a significant amount of fluid with an elevated cell count *prior to treatment appeared to have no excessive joint fluid after* treatment No correlation between subjective and objective improvement could be made

No euphoria or other systemic effects due directly to the drug were experienced by any of the patients but there did appear to be an improvement in the general condition of the patients which was believed to be due to the relief of pain and other subjective complaints

DISCUSSION

Hydrocortisone appears to be a valuable adjunct in the treatment of certain patients with rheumatoid arthritis It is believed that intra-articular injection of 25 mg of the drug into knee joints and of 15 mg into the ankle joints is indicated if the joints are so painful that the patient must remain in bed Most patients thus treated were able to walk with little or no discomfort within a few hours after treatment Early ambulation encouraged the patient and enabled him to start physiotherapy and physical reconditioning along with other conventional modes of treatment To utilize

[illegible] adjunct seems to shorten the course of the disease and to make the patient comfortable much sooner than he otherwise would be

Intra-articular injections of hydrocortisone could undoubtedly be used to great advantage in the evacuation of patients evacuees to fixed hospitals in the United States and of certain patients from station to general hospitals within the United States Many patients at this arthritic center have been retained in overseas hospitals for prolonged periods of time because they were having severe pain It is believed that many of them could have been comfortably transported soon after the onset of the disease by the use of intra-articular hydrocortisone therapy

We should not rely on such intra-articular injections to alter the course of rheumatoid arthritis because hydrocortisone merely lessens pain in weight-bearing joints, permitting transportation and early ambulation

SUMMARY

Sixty-eight intra-articular injections of hydrocortisone were made into 23 joints of 17 patients with rheumatoid arthritis Significant subjective improvement occurred in 16 of the arthritic joints Relief of pain enables early ambulation and prevents the adverse effects of prolonged bed rest Objective improvement was noted in 14 of the 23 joints treated Acutely painful joints seem to respond better to early in the course of the disease hydrocortisone therapy than chronically involved joints with thickened, boggy synovia Although hydrocortisone, given intra-articularly, should be a definite aid in evacuating overseas patients with severe pain, it does not appear to alter the course of rheumatoid arthritis

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BOOK REVIEWS

The Esophagus and Its Diseases by *Eddy D Palmer* M D F A C P Lieutenant Colonel Medical Corps United States Army Chief Gastrointestinal Section Walter Reed Army Hospital Consultant in Gastroenterology to the Surgeon General Illustrations by *Phyllis Anderson*. 553 pages illustrated Paul B Hoeber Inc New York N Y publisher 1952 Price $15

Advances in thoracic surgery have made possible the correction of many disease conditions affecting the esophagus With this stimulus roentgenographic and esophagoscopic examination of this organ is being employed with increasing frequency, skill

and enthusiasm disease is more often recognized and hitherto obscure symptomatology explained The author has provided a scholarly guide to the study of the esophagus After considering in great detail the anatomy and clinical physiology he discusses the anomalies malpositions and individual disease states in 25 chapters References to the literature are extensive Endoscopic and surgical technics are not detailed but are mentioned if they are important points in diagnosis or therapy The many line drawings and halftone reproductions of roentgenograms are of high quality well chosen and well printed

This book will be valuable to each member of the team treating diseases of the esophagus the internist roentgenologist endoscopist and the surgeon Written from the viewpoint of the internist its scope is not limited to surgical diseases of the esophagus nor its utility to hospital practice

—Lt Col B H Sullivan Jr MC U S A

Th M tally R tard d Ch ld A G d fo P rent by *Ab aham Lev n* M D P fes r of P d t s N thwe ter U v ty M d l School P of s r d H d f D partment of Ped tri s Cook Co nty Grad u t S h l f H di Chi f of th P d t c N psychiat y S rvc nd Ch f f St ff Ch ldr n D s ion of the Cook C unty Ho p t l Se Atte d g Phy Sar h Morri H p tal of th M ch l Rees Ho p tal Se ior P di t n M t S nai Ho p t l Dir t r of th D Juli D Levi Re e h F und ti Pr p r d d r a pic of the *Dr J l D Lev s R ch Foundat on.* 190 p g s) The Joh D y Co N w Yo k N Y p bl her 1952 Pric $2 75

The author of this small but very readable volume has brought together in the form of a handbook for parents the current knowledge regarding the retarded child The material is presented in a straightforward yet warm and understanding manner Dr Levinson begins with acceptance of and a discussion of the feelings and reactions of the parents of retarded children This is followed by chapters on history definitions anatomy diagnosis causes prevention education and training of the retarded child prognosis community and state responsibility, and research There is also a short description of the Dr Julian D Levinson Research Foundation which fosters research and clinical study in pediatric neurology at the outpatient department of the Cook County Hospital in Chicago A chapter dealing with the questions most frequently asked by parents at that clinic along with the answers reviews and summarizes the previously presented material A bibliography and a list of state county city and private institutions for mentally retarded children in the United States are included at the end of the book This book is highly recommended to the physicians as well as to the parents of mentally retarded children

—Lt Comdr R E Switzer MC USN

TORSION OF THE SPERMATIC CORD AMONG MEN OF MILITARY AGE[1]

CLYDE L. DEVI G M. D

FURDICK G CLARKE *Lieutenant Commander* M C U S N R.

PROMPT recognition and surgical treatment of torsion of the spermat c cord will permit an organ to be saved which otherwise usually undergoes hemorrhagic necrosis and eventual atrophy The disease is therefore important and should oe regarded as a surgical emergency Among a group of 13 patients studied by us (2), the average age was 18 5 years

PATHOGENESIS

The disease manifests itself as 2 distinct entities In infancy, torsion occurs above the reflection of the tunica vaginalis on the cord, extravaginally, and results from the extreme mobility of the scrotal contents during this period of life The commonest form of torsion occurs in young men and is the result of abnormal testicular attachment due, with about equal frequency, either to defects of descent or to anomalous serous investments within the scrotum The latter are usually bilateral and characteristically consist of absence of the gubernaculum testis and mesorchium with high investment of the tunica vaginalis about the spermatic cord (fig 1) Torsion, which in these cases occurs within the tunica vaginalis, occurs on one side or the other with about equal frequency and is occasionally bilateral The twist may be in either direction Among patients with torsion of incompletely descended testes, malignant tumors have been found in about 5 percent.

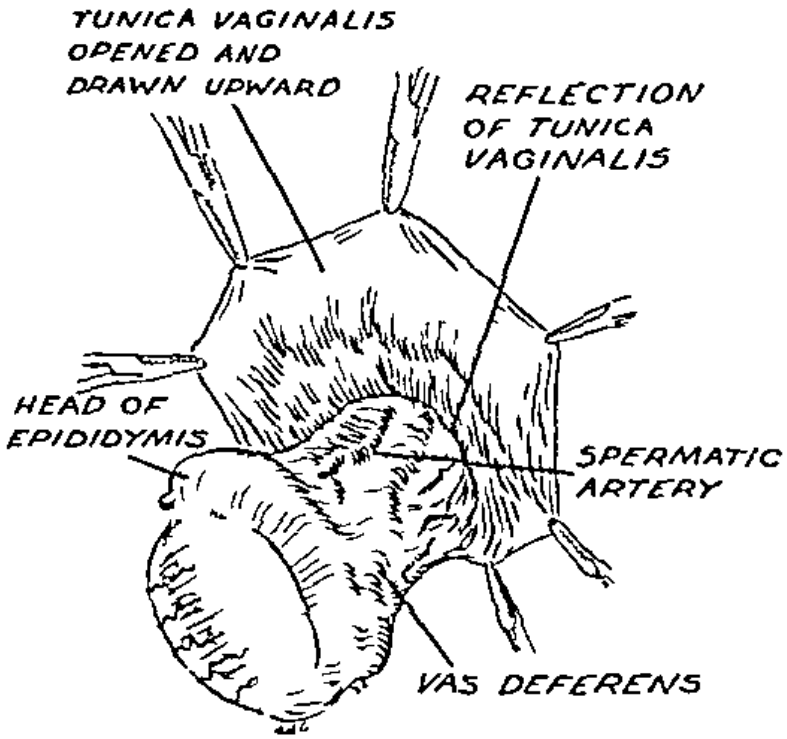
DIAGNOSIS

The commonest conditions from which torsion of the spermatic cord must be distinguished are torsion of the appendix testis, strangulated hernia, traumatic orchitis or hematocele, acute epididymitis, and acute orchitis If diagnosis is in doubt, the exponent of operative exploration to relieve pain is indicated

(1) From the Department of Urology and the Army Medical School Washington D C

(2) Data obtained from a study of cases of testicular torsion at Walter Reed General Hospital

Among our patients testicular pain invariably began abruptly In none of the patients was it preceded by injury and in o it oc curred during sleep Five patients had vomited Although the findings varied, fever was usually low or absent the pulse rate was normal and mild leukocytosis was present with slight in crease in the proportion of polymorphonuclear forms In none of



F gu e I Left scr tal t nts f a pati t who had p ev ously lost the ght t st as the lt of t sion of th spermat c cord. The operat on wa pe f rm d as a prophylact c m a e and di l ed ab ence of the guberna lum t t s a d m ch m u th h gh vestm t of the tuni a vag al s ab t th permat c cord

the patients were significant abnormalities elicited by urinaly sis or prostatic palpation A tender indurated scrotal mass was present on the affected side and the scrotal contents were re tracted upwards by torsion of the cord itself and by cremasteric spasm (fig 2) The sign described by Prohn was of great value in differential diagnosis Elevation of the scrotum intensified the pain rather than as might be expected in epididymitis relieved it.

TREATMENT

Torsion of the spermatic cord must be recognized as a surgi cal emergency Although spontaneous or nonoperative reduction may occur the usual course is for reversible ischemic change to be rapidly supplanted by hemorrhagic necrosis which gradu ally evolves to atrophy and fibrosis

The scrotal contents are exposed through a low inguinal or a scrotal incision, the scrotal coats and tunica vaginalis are opened, and the torsion reduced If, after a reasonable interval, apparently normal circulation returns to the organs, orchidectomy is not carried out The parietal layer of the tunica vaginalis is excised as in operation for hydrocele and the testis anchored to the scrotal wall by a suture to each of its lateral surfaces If the



Figure 2 Upward retraction of left scrotal contents in a case of torsion of the spermatic cord of 3 hours duration

operation is performed soon enough normal testicular structure and spermatogenic function will be preserved In the majority of cases a similar procedure will be indicated as a prophylactic measure on the other side of the scrotum and may be carried out simultaneously or at a second operation

ACKNOWLEDGMENT The authors are grateful for the aid of Dr Louis R M Del Guercio in preparing the illustrations and of Dr Muriel V Hayward in making translations

BOOK REVIEWS

Culdoscopy A N w Te hn c *in Gy c log c* and Obster c D gn sis by *Alber Decker* M D D O G F A C S Cl cal P f s ol Gy e I gy and Obst tri s N w Y rk Polycl nic M di al Sch ol and H pital Asso ci te Att nding Physic an i Gy e ology d Ob tet c N York Polyclinic Hosp tal Atte di g Gy colog c Kn ck bo k H sp tal with fo eword by *R cha d W TeL d* M D *148* p g s Il strat d W B Sau d s C Phil delph P p bli her *1952*

This inexpensive and practical monograph is well written and excellently illustrated It reveals the ingenuity and expertne s of the author as well as his extensive experience in culdo cop It is the first attempt to present the subject in a comprehensive manner The first chapter is devoted to the history of vi ceral visualization Following this the pertinent anatomy of the vagina and related structures is presented The relatively new gynecologic diagnostic instrument, the culdoscope is described in detail together with the approved culdoscopic technic The several indications and contraindications technical details and dia nostic possibilities of culdoscopy are both practical and intere t ing reading The monograph is replete with pertinent information. References are complete The book is recommended to the stu dents and physicians interested in obstetrics and gynecology

—*Col E A Zimmermann MC U S A*

Phy ical Foundati n of Radiology by *Ott Gla s* P f s or of Bo physics and he d of *Dep rtm nt* of B ophys c Cl l nd Clin *Fo ndatio Cle eland Oh o, Ed th H Qu mby As* ociat P ol s or of *Radiology (Phys cs) Coll ge of Ph si i s a d Surg n* Columb *Un versity New Yo k Lu st n S T ylo* Ch f Atomic d Ra tio Physics Div i n i t o al B of Sta dard Wash ngton D C and *J L. W atbe wax* American Oncolog c H pital and Gradua *School of M dicin* Un rs ty of P nn yl i Ph lad lphia L. *edition* Re is d d F larged 581 pages ill st t d P I B H le l c New York N Y p bl hers 1952 Pr e $6 50

Many significant changes from the first edition have bee made in *this new* volume Chapters on measurement and dos e of radioisotopes, on high energy accelerators and on supe voltage equipment have been added New do age tables for linear radium sources are presented and the dosage table for x ray have been expanded to include amounts neces ry to penetrate 8 mm of copper The new edition should be wo t wel come to all students, residents and phy icians intere ted in radiology The first edition has been required read n for tho e interested in this field and the new edition will surely rema the outstandin single source of radiation physics as related to the field of medicine —*Lt J H Heald MC U S N*

CLINICAL EVALUATION OF PHENYLBUTAZONE[1]

RALPH M PATTERSON *Colonel MC U S A*
JOHN F BENSON *Captain MC U S A*
PAUL L SCHOENBERG *First Lieutenant MC A U S*

PHENYLBUTAZONE is a new oral medication used as an adjunct in the treatment of arthritis and allied disorders It is a nonhormonal synthetic drug that has analgesic, antipyretic, and anti inflammatory properties In Europe it has been widely used alone or in combination with aminopyrine for a number of years Such conditions as gout rheumatic fever rheumatoid arthritis, fibrositis, bursitis, neuralgia, herniated intervertebral disk, and sciatica have been reported as responding to this drug In the United States there have been promising clinical trials by various investigators *(2–5)* Most of the recent reports have evaluated its effect on rheumatoid arthritis, spondylitis, and gout. Steinbrocker et al *(3)* stated that about 70 percent of rheumatoid patients received marked subjective relief and 93 percent obtained marked objective improvement Other investigators *(4 5)* did not observe as marked an objective improvement in their patients, but all agreed on its analgesic property Phenylbutazone has shown its most dramatic results in the treatment of acute attacks of gout Its effect is said to be superior to that of colchicine in relieving the pain of gout *(5)*

In the belief that a closely controlled study of the effectiveness of this drug was indicated in rheumatoid arthritis, a group of 32 patients was selected for study They were chosen for their marked degree of discomfort and their lack of response to other forms of treatment Of these, 20 had a diagnosis of peripheral

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(1) Army and Navy Hospital Hot Springs Ark

(2) Kuzell W C Schaffarzick R W Benson B and Mellinkoff E A Phenylbutazone (butazolidin) in rheumatoid arthritis and gout J A M A 149 729 734 June 21 1952

(3) Steinbrocker O Berkowitz S Ehrlich M Elkind M and Carp S Therapeutic observations on butazolidin (phenylbutazone) in chronic rheumatic disorders and related conditions Presented before the Annual Meeting of the American Rheumatism Association Chicago June 6 1952 Abstract by Pharmaceutical Division Geigy Co Inc

(4) Freyberg R H Boyce K C and Kidd E C Studies of butazolidin and butapyrin in patients with rheumatic diseases Paper read before the Annual Meeting of the American Rheumatism Association Chicago Ill June 6 1952 Abstract by Pharmaceutical Division Geigy Co Inc

(5) Kuzell W C Schaffarzick R W Phenylbutazolidin) and butapyrin in arthritis

rheumatoid arthritis 4 had spondylitis and 8 had spondylitis with peripheral joint involvement The severity of the disea e varied widely The majority had early manifestations of a moderate degree Five of the group with peripheral joint involvement had marked gross deformity and acute symptoms All patients were of military age the average being 29 years The duration of acute symptoms was from 1 to 18 months (average 6 7) All but 6 patients had been treated within the preceding months with intravenous typhoid vaccine gold, or x ray to the spine The standard treatment consisted of 600 mg phenylbutazone daily for 2 or 3 weeks Thirteen patients were on this medication for 1 week or less and 2 were treated for over 60 days

The involved joints were observed daily Twice a week a hemogram, urinalysis and sedimentation rate were recorded The patient's comments on his subjective symptoms were also noted

TABLE 1 *Results f us of ph ylb taz e i 32 p t ts w th rhe matoid a thri s*

Improvement	Objective		S bj t	
	Number	P c t	Number	Perc t
Marked	0	0	13	40
Mod rate	3	9 5	10	32
Mi imal	6	18 7	8	25
No	23	71 8	1	3

A ea on ur d 5 (15 p t)

In 21 patients intermittent placebo therapy was given over a course of 1 or 2 weeks At no time did the physician or nur e know which patient was receiving the placebo but in most cases the physician could guess correctly which patients were receiving the placebo by the subjective complaints Five patients showed moderate subjective improvement while taking the placebo Three of these obtained further relief when phenylbutazone was given.

Results Of the 32 patients none obtained marked objective improvement or a clinical remission and only 28 2 percent obtained moderate to minimal objective improvement. Subjectively 72 percent had marked to moderate relief of their pain stiffness and aching (table 1)

Of those patients who received moderate objective relief all had spondylitis Increased mobility and decreased stiffness in their spines were noted Six patients had minimal regression of their intra articular effusion while taking the drug but in none

and the effusion or swelling completely subside One patient, a 35 year old woman, with a long standing peripheral rheumatoid arthritis, developed an acute prepyloric ulcer after 48 hours of therapy This was proved by roentgenograms The drug was immediately discontinued and medical treatment healed the ulcer within 3 weeks

Typical of the enthusiasm of the patients toward this new drug were such remarks as, "a super aspirin," "much better than large doses of aspirin," and "similar to x ray therapy to the spine"

Reactions Two patients had a transient euphoria and complained of insomnia after 1 week of medication, but this was not considered significant and the drug was not discontinued These complaints lasted for only 3 days and spontaneously subsided Two patients developed hematuria and neutropenia respectively, which necessitated the discontinuance of the drug Both were concurrently receiving gold therapy which may have been the cause of the reaction No dramatic weight gain, edema, nausea, or anemia were observed

CONCLUSIONS

The antirheumatic effect of phenylbutazone has *not* been confirmed by the results obtained in this series of patients Less than 30 percent of the patients were objectively improved and one third of these were patients with spondylitis In no patient was a clinical remission brought about, a sedimentation rate lowered, or more than a minimal amount of swelling reduced What little objective improvement was observed could have a natural remission not related to the medication The analgesic property previously reported was definitely observed in these patients We believe that phenylbutazone is an excellent adjunct to the treatment of rheumatoid arthritis but that it produces no true antirheumatic effects

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BOOK REVIEWS

Antoine Lavoisier Scientist Economist Social Reformer by *Douglas McKie* D. Sc Ph D Reader in the History of Science in the University of London 440 pages illustrated Henry Schuman Inc New York N Y publisher 1952 Price $6

Lavoisier is justly regarded as one of the real founders of modern chemistry His elementary textbook on the subject contained the evidence that destroyed the old phlogiston theory

He showed that air consisted mainly of two gases one of which he named "oxygen" the first use of that name in chemistry He showed the true nature of combustion and animal respiration. He made the first chemical analysis of water and he drew up the first table of chemical elements He greatly improved the manufacture of gunpowder in fact, Dr McKie believes that his work in this field had an important influence on the Napoleonic wars The formulas and methods used by Lavoisier in the preparation of gunpowder were brought to this country by Pierre du Pont when he emigrated to the United States and eventually founded the great chemical firm of that name in Delaware. Lavoisier was also an advocate of what we now call social security He made and published an important economic study of the wealth of France as a basis for taxation Born in Paris in 1743 he died under the guillotine in 1794 in the turbulent days of the French Revolution One of the greatest men of science it took as his contemporary the mathematician Lagrange said Only a moment to cut off that head and a hundred years may not give us another like it." All these things Dr McKie describes in this fine biography Particularly good are the accounts of the historical and social background of eighteenth century France and the history of chemistry prior to the work of Lavoisier His contributions to that science are thus well shown in relation to his predecessors There are many rare and carefully chosen illustrations and the format of the book and the typography are excellent.

—*Capt L H Rodats MC USN (Ret)*

Infrared Photography in Medicine by *L o C Mas pust S* Director Department of Art and Photography Marquette University School of Medicine Milwaukee Wisconsin American Lecture Series Publication Number 152 A Monograph in American Lectures in Medical Photography 53 Pages Illustrated Charles C Thomas Publisher Springfield Illinois 1952 Price $2 75

This small but informative volume is written with the emphasis on the various applications of infrared photography in the field of medicine The book shows graphically the use of infrared photography in photomicrography gross specimens and clinical patients Although the book fulfills the purpose of the author to show the applications of infrared photography it leaves much to be desired as far as the technic of lighting processing and completion of the finished print are concerned The illustrations are of good quality and the book is well printed The references listed form a nucleus for further investigation of infrared photography

—*F W Miller Medical Illustration Section*
Walter Reed Army Hospital

THE ELECTROMYOGRAM IN CONFIRMATORY DIAGNOSIS OF PSEUDOPARALYSIS

JOSEPH GOODGOLD *Captain MC U S A* (1)

PARALYSIS based on psychiatric breakdown frequently occurs in military medical practice In World War I there was an appreciable incidence of so-called shell shock with its varied hysterical manifestations In a study based on experiences of the Spanish Civil War, Mira (2) stated that conversion hysteria constituted a core for most war neuroses Although a general review of this type of psychiatric case during World War II and the present Korean conflict reveals that the conversion hysterias have given way as the most prevalent type of war neuroses to the 'anxiety" type of reaction (3) there is still a significant number of patients with pseudoparalysis

ETIOLOGY

The cause of this condition may be classified as follows (1) malingering, (2) functional overlay, and (3) conversion reaction

Malingering From a diagnostic viewpoint, the conscious simulation of paralysis is the most easily recognized The paralysis generally involves a functional group rather than a group supplied by a single nerve The paralysis is often associated with a variety of subjective complaints and the patient invariably shows a tendency to overdramatize his disability There is a sharp contrast between the malingerer's attitude toward his paralyzed limb and "the beautiful indifference" of the hysterical patient (4) Some patients, however, are extremely difficult to evaluate and require continued observation and concise examination before a diagnosis may be established (5)

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(1) United States Army Hospital Fort Campbell Ky

(2) Mira E Psychiatry in War W W Norton & Co Inc New York N Y 1943 p 83

(3) Overholser W and Richmond W V Handbook of Psychiatry J B Lippincott Co Philadelphia Pa 1947 p 200

(4) See p 173 of footnote reference (3)

(5) Wechsler I S A Textbook of Clinical Neurology (th edition W B Saunders Co Philadelphia P 1947

Functional overlay Patients in this category present the most difficult problem They have definite organic bases for their paralysis but the difficulty arises when recovery time and the persistence of functional disability far beyond the expected time is considered The shortage of hospital bed space and loss of time from duty may aggravate the problem

Conversion reactions The basis for paralysis in these patients lies in their desire to escape a distressing situation while maintaining a socially acceptable behavior pattern It is an unconscious counterpart of the well known face saving device As with the malingerer, the average patient present little difficulty in detection but there is a fair number who tax the diagnostic acumen of even the most careful observer

DIAGNOSIS AND CARE

The diagnosis and care of patients with pseudoparalysis demands the coordinated activity of the neurologist neuropsychiatrist neurosurgeon and physiatrist Each within his own field carefully reviews the patient s history and makes a physical examination Studies of the electrophysiologic aspects fall within the province of the physiatrist. Erb s test and careful voluntary muscle analyses represent good screening studies More accurate and detailed information is available with strength duration curves rheobase chronaxie and galvanic-tetanus ratio determinations For a rapid highly informative, and accurate evaluation the information supplied by electromyography appears to be the method of choice especially with the more complex problem of long standing In civil life the evaluation of these patients may involve compensation and medicolegal problems Electromyography could be of the utmost importance in the equitable disposition of such cases

Principles of electromyography The use of electromyography as a diagnostic and research tool has been reviewed by others *(6 9)* Electromyographic diagnosis is based on the fact that contraction of a normal voluntary muscle and is associated with a definite electric potential which can be quantitatively and qualitatively studied The electromyograph incorporates a cathode ray oscilloscope and an audiometer so that the potential waves can

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(6) G l th J G d F ll J A El t my g ph ud t ahes tu d tur f sc erv Am J Phy l 150 558 567 Oct 1947

(7) Wedd ll G F B nd P l R E Electr cal ty f luntary m l in ma nd ormal d pa h log l d Brain 6 178-257 Sep 1944

(8) Malm R B Shag C d Da J F M thod f t gat on of oma p m b m p y h ur Sc 112 325-328 S pt 22 1950

(9) Shag C. Malmo R B d Da s J F Abnormal lectr y gr ph t pon t en oty m La psy h ur (Ab) R Canad B l 9 91-92 Apr 1950

be observed and listened to at the same time The potential of a normal voluntary muscular contraction is termed a normal motor unit output. Normal voluntary muscle, at rest, is electrically silent. *A muscle which has suffered injury to its nerve, will* after about 21 days, begin to show a rhythmical twitching of its individual fibers This is evident, electromyographically, as an electrical potential output of short-duration, low amplitude

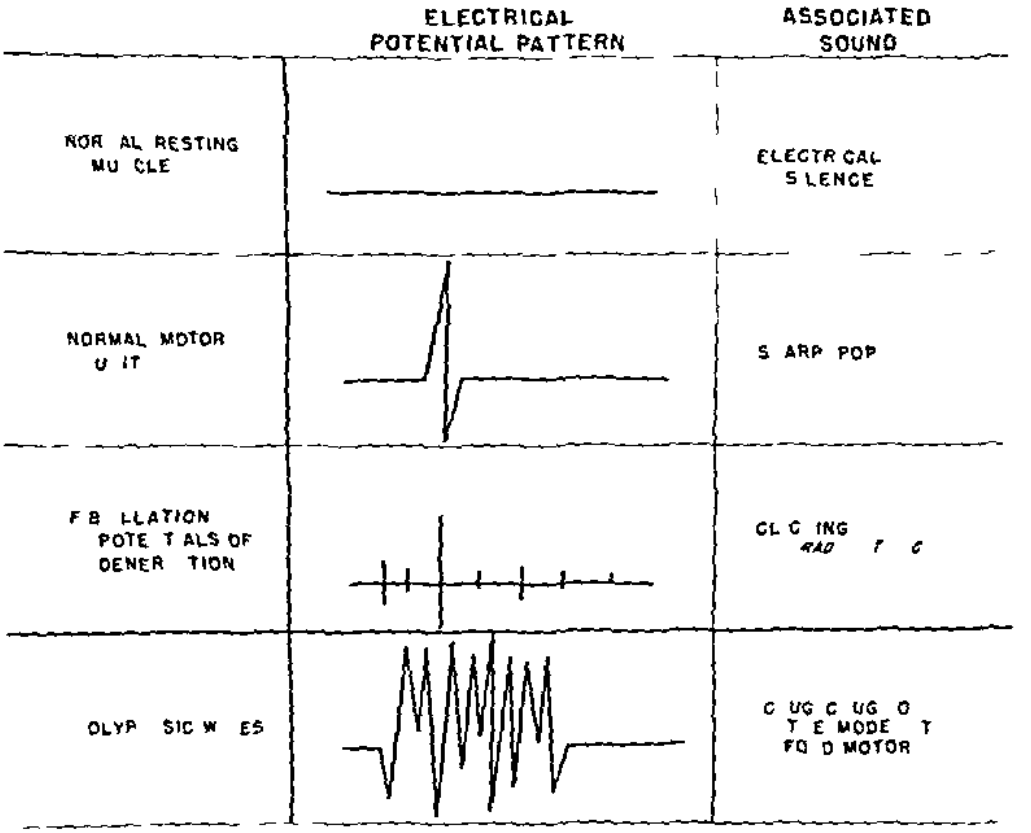


Figure 1 Electromyographic wave forms and associated sounds

waves associated with characteristic clicking sounds similar to radio static. These are present when the muscle is at rest. During denervation and regeneration when demyelination is occurring, characteristic complex wave forms (polyphasic waves) are present (fig 1)

Thus denervated muscles will show fibrillation potentials When regeneration commences, polyphasic waves will make their appearance As the regenerative process continues, the polyphasic waves will be replaced by normal motor units If denervation progresses to the point of total loss, the muscle undergoes extensive fibrosis and the fibrillations disappear, giving way to electrical silence

In the examination of the suspected paralytic patient it is essential to determine

1 Whether there is any electrical activity in the muscle when it is at complete rest, that is, are fibrillations present? If the

are it is indicative of lower motor neuron involvement and can be accepted as definite evidence of organic disease

2 Whether there is electrical silence when the muscle is at rest whether muscle atrophy is present whether the injury is of long duration and whether there is any fibrosis as evidenced by examination and resistance to needle insertion?

3 What happens when the patient attempts to contract the muscle? This observation is concerned with the presence of motor unit output. Frequently normal motor units are observed in a patient who protests that his limb is paralyzed

CASE REPORTS

Case 1 A 28 year old man was wounded by shell fragments on 14 October 1951 in Korea He noted that his left little ring and middle fingers curled up and could not be used immediately after injury This paralysis was still present on admission to this hospital on 21 April 1952 In giving his history the patient remarked that there were lots of fellows in the ward with the same thing and that they could not use their fingers either

A well healed scar was present over the left mid forearm The little ring and middle fingers were strongly flexed into the palm The index finger was held in a neutral position and was mobile No sensory deficit or atrophy was noted An electromyographic study on 23 April revealed that no fibrillation potentials were present in the extensors of the wrist and digits Normal motor units were evoked on attempted voluntary contraction This patient was followed up with a neuropsychiatric evaluation including an interview under barbiturate sedation The paralysis was completely "lost" on 25 April and the patient was returned to duty on 30 April 9 days after admission to this hospital

Case 2 A 23 year old man was struck by shell fragments in the left buttock and abdomen in Korea on 12 January 1952 Immediately following injury his entire left lower extremity was paralyzed and numb A laparotomy with extensive intestinal repair was performed on the day of injury The patient was hospitalized continuously and reached this hospital on 7 March A notation by his attending physician relative to the residual paralysis strongly indicated that the disability was functional Examination at the time of admission revealed a scar high on the posterior lateral aspect of the thigh The left lower extremity showed good motor power except that a foot drop position was maintained This prevailed in spite of the fact that strong voluntary dorsiflexion of the foot was possible No sensory defect was noted The reflexes were intact Calf measurement

9 inches below the lower border of the patella was 15¼ inches on the left and 15 inches on the right. Neurodermometric study revealed increased sympathetic activity of the left foot. The patient persisted in the complaint "I can't turn my foot in." The results of electromyography performed on 14 May are shown in table 1.

TABLE 1 *Electromyographic study (Case 2)*

Muscle	Resting	Voluntary contraction
Peroneus longus and peroneus brevis	Electrical silence	Normal motor units 25 percent complex wave forms
Extensor hallucis longus	Fibrillation potentials of denervation	30 percent fibrillation waves low voltage motor units poly phasic waves
Tibialis anterior	Fibrillation potentials of denervation	Fibrillation potentials no polyphasic waves or normal motor units

Although the clinical impression in this case favored a functional type of paralysis, electromyography clearly demonstrated that an organic basis for the disease was present. Recovery of function was already present in the anterior compartment muscles except for the prime inverter, the tibialis anterior.

TABLE 2 *First electromyographic study (Case 3)*

Muscle	Resting	Voluntary contraction
Tibialis anterior	Electrical silence	Electrical silence
Extensor hallucis longus	About 2 percent fibrillation potentials of denervation	Polyphasic waves and low voltage motor potentials
Peroneus longus	Silence except for scattered runs of fibrillation	Polyphasic waves and low-voltage motor units
Peroneus brevis	Silence except for scattered runs of fibrillation	Polyphasic waves and low-voltage motor units

Case 3 A 24 year old man suffered a perforating gunshot wound through both thighs at a level close to the trochanters, as well as a penetrating gunshot wound of the face, in Korea on 22 September 1951. Immediately following injury he noted numbness of the anterior aspect of his left leg below the knee and numbness of the dorsum of his left foot followed within

a few days he noted numbness of the sole of his right foot. He said that both legs were paralyzed. A reparative operation was performed and he was returned to the United States in October Examination on admission to this hospital revealed a pare is of both legs below the knee Bilateral foot drop was present. Paralysis was more marked on his right side I e developed causalgia of his right foot which cleared after a single para vertebral sympathetic block

TABLE 3 *S co d l ct my g aph tudy (Ca 3)*

Mu l	R t &	Volunt y c tra tio
Tib l ter	El ctr c l l c	Low oltage m r it
P on lo g	El t c l lenc	N rmal moto u ts
P us br i	Ele trical il c	L w olt mot t
Ga t cnem	El ctric l le e	Low lt ge m t r un t

Fxamination in the physical medicine section in February 1952 revealed a diffuse, spotty involvement of the muscles supplied by both common peroneal and posterior tibial nerves Sensory impairment was also diffuse and spotty His an le jerk was absent on the right but present on the left Erb s test supported a diagnosis of a partial bilateral sciatic lesion An intensive physical therapy and rehabilitation program was instituted at this time On repeated clinical evaluations the patient showed a poor response to therapy associated with a variance in findings on repeated voluntary muscle analyses The results of electromyographic studies performed on 8 May which included sampling in distal and proximal portion of the muscles are shown in table 2 The impression of a strong functional overlay was reported to the clinical section

A neuropsychiatrist saw the patient on 23 May and made a diagnosis of inadequate personality chronic moderate manifested by inability to function independently at home and physical exaggeration of organic injuries The patient was given psychotherapy

The results of a second electromyographic study performed on 29 May are shown in table 3 This patient demonstrates a complex clinical problem which is frequently encountered in battle casualties The desirability of careful evaluation is apparent. The electromyographic studies were of prime importance in establishing the diagnosis

HEPATIC AMEBIASIS

Abscess and Probable Rupture Into the Peritoneum With Survival (1)

HAROLD A BRAUN *Captain U S A F (MC)*

ROBERT B STONEHILL *Captain U S A F (MC)*

INTESTINAL amebiasis is common, especially among indigenous personnel in the region of this hospital, but serious illness from extraintestinal invasion by *Enda-oeba histolytica* is rare The following case of liver involvement is reported because of the patient's survival following generalized peritonitis presumably due to rupture of a hepatic amebic abscess In addition, the development of chronic liver impairment in this patient emphasizes the importance of early diagnosis and treatment of hepatic involvement in amebiasis

CASE REPORT

A 29 year old Filipino began to have a mild intermittent diarrhea 6 months prior to his admission to this hospital on 31 December 1951 Two months before entry he noted anorexia, malaise, and a decrease of weight from 115 to 85 pounds During the preceding 6 weeks he had had nausea, vomiting, fever, and severe pain in his right flank His feces had never been bloody or clay colored and his urine had never been dark

Examination revealed a cachectic, dehydrated man who was having great pain His temperature was 100 4 F and his pulse was 120 His chest was clear except for signs of an elevated, fixed right hemidiaphragm Fluoroscopy and a roentgenogram of the chest confirmed these findings and revealed a small right pleural effusion The upper border of liver dullness was in the fifth interspace and the liver edge was felt 4 cm below his costal margin His spleen was not palpable There was no ascites, edema, or jaundice

During the first day he had 3 diarrheal stools, each of which contained many motile trophozoites of *E histolytica* His leukocyte count and serum bilirubin were elevated (table 1) His temperature rose to 102 F during the first night The fever was associated with spasm and tenderness in the right upper abdominal quadrant Thirty six hours after admission his condition

(1) U S Air Force Hospital Clark Air Force Base P I

TABLE 1 *Repetitive laboratory findings*

	Admission	Third week	Fifth week	Sixth week
Erythrocytes (million)	4.0	3.7	4.1	4.1
Leukocytes	20,250	14,650	9,500	8,000
Neutrophils (percent)	80	76	64	62
Lymphocytes (percent)	20	21	35	37
Eosinophils (percent)		3	1	1
Bilirubin (mg per 100 cc)	1.75	1.50	0.5	0.5
Albumin/Globulin (gram per 100)	1.55/2.05	1.60/1.15	3.2/2.0	3.10/2.6
Cephalin flocculation	*Extremely*	Negative	Negative	Negative
Stool	Plus 1 fluid dark phlegm	Normal dark phlegm	Normal mucoid dark phlegm	Normal mucoid

suddenly deteriorated, boardlike abdominal rigidity, distention, icteric scleras, and shock appeared The shock improved following blood and plasma infusions but the signs of peritonitis with ileus persisted, necessitating 12 days of Wangensteen drainage The diagnosis of peritoneal rupture of a hepatic amebic abscess seemed quite certain and emetine, penicillin, and streptomycin were given During the fourth week chloroquine was also given for its amebacidal effect

The supportive treatment of this patient included the giving of 500 cc of plasma, 2,500 cc of whole blood, 700 cc of concentrated, salt-poor, human albumin solution, and various fluids containing sodium chloride, potassium chloride, sodium lactate, dextrose, and protein hydrolysate Antibiotic therapy for a possible secondary bacterial peritonitis consisted of 8,000,000 units of aqueous penicillin in 14 days and 19 grams of dihydrostreptomycin given over an 8-day period Amebacidal treatment consisted of giving 280 mg of emetine hydrochloride subcutaneously in 7 days, 2 courses of chloroquine diphosphate (4 grams in 6 days and later 11 grams in 19 days) and 50 grams of diodoquin (given in 2 courses)

The abdominal tenderness and rigidity began to subside in 4 days after the administration of emetine and antibiotic therapy was started Temperature peaks reading 102 F gave way to an intermittent low grade fever, and by the third week the temperature and pulse were normal Surgical consultants at no time found evidence of localized peritoneal infection necessitating drainage Ascites and moderate dependent edema became apparent during the third week, at which time the serum albumin concentration was 1 6 grams per 100 cc A small amount of clear, bile stained ascitic fluid was aspirated for diagnostic study This did not clot, was sterile, and contained 61 leukocytes per cu mm The patient's appetite improved slowly and by the fifth week he was consuming about 2 500 calories and 80 grams of protein daily He had a barium enema and sigmoidoscopy in the sixth week These revealed no abnormality By the eighth week he was ambulatory, ascites and edema were minimal, and the serum albumin concentration had risen to 3 1 grams per 100 cc In the eleventh week he was sent home for further convalescence, and advised to take vitamin and protein supplements to a high caloric, high protein diet At the time of discharge his liver was only slightly enlarged and a roentgenogram of the chest was normal

DISCUSSION

Hepatomegaly with intestinal amebiasis The term, hepatomegaly with intestinal amebiasis, describes the asymptomatic liver enlargement and tenderness found in some patients with

intestinal amebiasis and no general evidence of infection The abnormal hepatic findings promptly disappear when diodoquin or some other intestinal amebacide is used Because these nonabsorbable drugs have little or no effect on trophozoites outside the bowel it has been suggested that this syndrome may indicate some secondary type of liver damage the precise mechanism for which is not clear *(2 3)*

Acute hepatitis In a collected group of 6,886 patients with amebiasis a diagnosis of hepatic abscess was made in 4 1 percent and of hepatitis in 9 percent *(4)* but the pathologic findings in hepatitis consisting of multiple small areas of focal hepatic necrosis suggest that clinical differentiation between hepatitis and hepatic abscess may be difficult Thus in the collected group it is conceded that some small abscesses were unrecognized healed with nonsurgical therapy and erroneously diagnosed as cases of hepatitis without suppuration The clinical manifestations usually point clearly to inflammatory hepatic disease with tenderness and swelling of the liver pain in the right upper abdominal quadrant, fever and anorexia Jaundice is rare The fact that more than one third of the patients with hepatitis or hepatic abscess may give no history of diarrhea is not generally appreciated *(4 6)* Except for progress to suppurative disease complications are infrequent response to treatment is prompt and the mortality is low

Hepatic amebic abscess This advanced stage of hepatic amebiasis is becoming less common and should be preventable The history indicative of hepatic disease is usually of longer duration than in patients with hepatitis Clinical indications that abscess formation has occurred may include a palpable mass leukocytosis anemia or the development of rupture Demonstration of the typical chocolate sauce" suppurate material is considered pathognomonic Because most abscesses develop in the infradiaphragmatic portions of the right lobe of the liver these patients may complain of pleuritic pain radiating to the right shoulder For the same reason roentgenographic examination will disclose significant abnormality in a large proportion of patients with abscess formations These findings include diaphragmatic

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(2) Sod ma W A Do A A. Go d E M d G ll k C. M. Chl q h pa m b A n. I M d 35 331 341 A g 1951

(3) Sod ma W A Am b p l l nic l p ur f h pa c m b Am. J T p M d. 30 141 146 Ma 1950

(4) DeBak y M E d O h A H pa m bia 20 y pe d nalys f 263 ca Surg Gy & Ob 92: S pp 209-231 Mar 1951

(5) Da F W J Am bia p J h Hopk H p l 1936-1946 Am J M. S 217 505-517 M y 1949

(6) Cr g C. F Th E l gy D gno d T m f Am bi s W ll & W lki Co Bal mo Md 1944 p 154

displacement and immobility, basal pulmonary reaction or pleural effusion

Complications which account for the significant mortality of patients with abscess formation result from secondary bacterial infection of the abscess or its extension to neighboring extra hepatic sites such as the pleural, pericardial, or peritoneal cavities In a series of 176 patients with abscess formation there were 16 whose abscesses ruptured into the peritoneal cavity In 4 patients with slow extension, the walling off process resulted in only localized peritonitis and there were no deaths Sudden rupture occurred in 12 All died promptly from widespread, acute peritonitis *(4)* Table 2 shows some of the contrasting features of hepatitis and hepatic abscess formation and has been prepared from data in 2 recently reported series *(4, 5)*

Treatment The commonly used intestinal amebacides result in the disappearance of hepatic enlargement and tenderness in those patients free of hepatic symptoms and described under the heading "hepatomegaly with intestinal amebiasis " For hepatitis or abscess, however, an absorbable agent concentrated in the liver is needed and emetine has long been known to be effective, as it was in the patient here reported The toxicity of emetine and the need for bed rest and close observation of patients receiving this drug are significant deterrents to its use

Four years experience has demonstrated the usefulness of chloroquine diphosphate in the treatment of hepatic amebiasis Its high degree of effectiveness, possibility of oral administration, and freedom from significant toxicity recommend its use *(2, 7 9)* An initial dose of 1 gram daily for 2 days followed by 0 5 gram daily for 2 or 3 weeks is recommended As with emetine, its ineffectiveness for the intestinal infestation requires that one of the intestinal amebacides also be given Harris and Wise *(8)* stated that chloroquine is the agent of choice in hepatic amebiasis and Conan *(9)* suggested that it be part of the therapeutic regimen of all patients with amebiasis because of the difficulty in excluding hepatic involvement

The antibiotics' true role as amebacidal agents is not yet clear A significant percent of treatment failures is reported

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(7) Zavala D C d Ham lt n H E Recogn t on and treatment of hep tic am bi asi Ann Int M d 36 110-125 Jan 1952

(8) H rris J B nd W s R A Chlor qu n tr atm nt of ameb c liv r abscess Am Pract 3 128-133 Feb 1952

(9) Conan N J Jr Treatmen of h p t c ameb asis with chlor quin Am J M d 6 309-320 Ma 1949

TABLE 2 C t t g/ t of am b c hepatit a d m b c h pat c b s

	H p t ti	H p t b
I d	8 3 t 9 0 p ıc t f p t t w th m b is	1 5 to 4 1 p c nt of p t t w th m b (4 5)
O t	Ac t	L k ly t be dıo s
I	U lly ın gt f l t	I gt f lt d ft n n ıght de f h t d ıght ho ld r
Γ	Almo t t bl	F q e tly o l w g de
F l ur p lm ary ıg s	Inf q t	F q e t
Blood o t	M d t l tıon f l ko yt o t and lıght d p f ryth cyt c t	M m k d l t f le ko yt c t d g t d p t f yth cy t
Ro tg gr ph b m lıty	In 50 p c t f p t t	I 85 p t f p t t
A p t	Ch l t p t bt bl	Ch l t p p th g om c
Compl t	Ab f m t	B t l f t and t
M t l ty	N	22 p t (4)

(10, 11) and one investigator suggests that chloroquine be used for its systemic action regardless of the antibiotic or other drug used for the intestinal infection (10) When surgical drainage or aspiration is necessary, it should be preceded by a course of emetine or chloroquine

The treatment of generalized peritonitis resulting from rupture of an abscess into the free peritoneal cavity has not received much attention in the literature, presumably because of the generally prompt fatal outcome Immediate supportive therapy for shock, relief of paralytic ileus, antibiotics for a possible secondary bacterial infection, and chloroquine or emetine for the hepatic infestation seem indicated Open peritoneal drainage is indicated only if the infection becomes localized

SUMMARY

A patient with hepatic amebiasis complicated by acute peritonitis, presumably due to rupture of an hepatic abscess survived The severity of the illness and the stigmas of residual hepatic impairment which developed emphasize the importance of early treatment of hepatic amebiasis

(10) Conn H C Amebiasis in veterans results of treatment with aureomycin and and chloramphenicol Gastroenterology 17 517 522 Apr 1951

(11) McVay L V Laird R L and Stern T N Neomycin in treatment of human amebiasis Am J M Sc 223 20-24 Jan 1952

BOOK REVIEW

Physics and Medicine of the Upper Atmosphere A Study of the Aeropause edited by *Clayton S White* M D Director of Research Lovelace Foundation for Medical Education and Research Head of a Section of Aviation Medicine Lovelace Clinic and *Otis O Benson Jr* Brigadier General U S A F (MC) Commandant U S Air Force School of Aviation Medicine The Proceedings of a Symposium on the Physics and Medicine of the Upper Atmosphere held at San Antonio Tex November 6-9 1951 sponsored by The Air University School of Aviation Medicine Randolph Field Tex Arranged by The Lovelace Foundation for Medical Education and Research Albuquerque N M 611 pages illustrated Published by the University of New Mexico Press Albuquerque 1952 Price $10

The participants in the symposium reported in this volume included experts in medicine, physiology, biology, genetics, toxicology, solar physics, astronomy, meteoritics meteorology, cosmic rays, rocketry and aeronautic engineering It would be difficult to place the credit for conceiving the need for such a symposium Judging by the enthusiasm shown by the authors,

a desire to participate evidently existed The editors must be congratulated for laying a sufficiently broad basis for a symposi um to attract nationally known authorities and for encouraging them to prepare in most cases new reviews of their cho en specialty

The keynote of this symposium was expressed by the senior editor when he demanded the progressive co operation of persons trained in the physical and biologic sciences in extending flight at increasing distances above the surface of the earth into the aeropause This he defined as that region in which the func tional effects of the atmosphere on man and craft begin to cease or as that region above which the consideration of the physi ologic requirements of man become increasingly important in the design of aircraft and auxiliary equipment

The opening chapter describes in the words of an engineer what we know today about flight at the base of the aeropause The author speaks with authority as he was one of the flight test engineers concerned with the design and development of the Navy Skyrocket which holds the world records for speed and altitude The second paper projects the parameters of manned flight far into the aeropause The next 12 chapters are essentially reviews of what we know about all the physical phenomena that occur in the aeropause and the final 3 chapters of the invited section of the book apply equally well to our terrestrial life as to the aeropause

The last 5 chapters of the book with 1 exception, cover state of the art discussions on our current knowledge of the physics of the upper atmosphere on methods and vehicles for research in the high atmosphere and on known and predicted problems of human travel in the aeropause These discussion groups succeeded in uncovering a wealth of miscellaneous tech nical information that has never been assembled before in a single volume

As stated by the Surgeon General of the Air Force in his fore word Medical research should be completed prior to the time the aeronautical engineer first sits down to his drawing board which is from 5 to 10 years before the projected aircraft s first flight One wonders what would have been the effect on the growth of aviation medicine 20 years ago if a similar sympo ium for interested scientists had been held on the physics and medi cine of high speed and high altitude flight

—Col A P Gagge U S A F (MSC)

PAGET-SCHROETTER'S SYNDROME

ROBERT C ZISS *Lieutenant, MC U S N R (1)*

VENOUS obstruction in the upper extremity is not common Hughes *(2)* collected 285 cases from the literature and added 35 of his own It is considered to be a specific entity and is called Paget Schroetter's syndrome after the first two writers to describe it *(3, 4)* It seems to occur more frequently in men (76 percent) and more often in the right arm (66 percent) than the left. There is usually a history of sudden onset of swelling or pain or both in the affected extremity Clinically one finds nonpitting edema of the arm and shoulders and distension of the superficial venous channels Often a deep, thromposed vein can be palpated *(5)*

No specific phenomenon has been implicated etiologically in this condition, but most writers believe that trauma plays an important role A careful history usually elicits a recent additional strain to the arm involved, either in lifting or pushing a heavy object, or in reaching over the head Investigations attempting to prove the etiologic significance of (1) primary thrombus formation, (2) infection, (3) abnormality in the venous wall serving as a site for thrombus formation, or (4) slowing of the blood stream due to extrinsic pressure from adjacent, abnormal anatomic structures or cardiac failure are inconclusive *(2)*

Its course is benign No recorded case has ended fatally but, although recovery is the rule, varying degrees of disability may result. The acute symptoms subside in from several days to about 3 weeks, but functional impairment of the arm and swelling may persist for months or indefinitely

CASE REPORT

A 32 year old man reported to the U S Naval Hospital on the U S S *Consolation* on 12 January 1951 Three days prior to

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(1) U S S *Fremont*

(2) Hughes E S R Venous obstruction in upper extremity (Paget-Schroetter's syndrome) review of 320 cases Surg Gynec & Obst 88 suppl 89 127 Feb 1949

(3) Paget Sir J Clinical Lectures and Essays Longmans Green & Co New York N Y 1875

(4) Schroetter von L Erkrankungen der Gefass Nothnag l Handbach der Pathologie und Therapie Wein Holder 1884

(5) Gould E P and Piney D H Primary thrombosis of axillary vein study of 8 cases Brit J Surg 16 209 213 Oct 1928

reporting there had been a sudden onset of aching in his left shoulder, immediately followed by swelling of the shoulder arm, and the left anterior aspect of the chest down to the nipple This was accompanied by mild malaise A medical officer advised the application of ice packs to the area, but when after 3 days this did not relieve either the pain or the swelling, the patient was admitted to the hospital He recalled that 2 weeks prior to the onset a friend had squeezed his left arm tightly during a scuffle A bruised spot was observed on the arm the next day He gave also a history of lifting moderately heavy objects into a locker above his head on frequent occasions during the preceding months



Figure 1 Photograph taken on the fifth hospital day showing the prominent superficial veins and the obliteration of the supraclavicular and infraclavicular fossas and the involved arm

His temperature on admission was 100 4 F His left arm was swollen to the mid forearm and edema was present over his left shoulder and upper anterior portion of his chest wall, obliterating the supraclavicular and infraclavicular fossas A blue pattern of distended prominent superficial veins were present over the involved area (fig. 1) The swelling was nonpitting in character and only slightly tender to palpation There was definite tenderness however along the course of the axillary subclavian venous channel No axillary lymph nodes were felt. The hemoglobin was 12 5 gm per 100 ml The leukocyte count was 9 800 with 59 percent mature polymorphonucleocytes 38 percent lymphocytes 2 percent eosinophils and 1 percent band forms The sedimentation rate (Wintrobe) was 25

The patient was given 300 mg of dicumarol on the first day 200 mg on the second day 100 mg on the third day and from 25 to 75 mg on the succeeding 11 days, as dictated by the daily prothrombin time which was held between 20 and 30 percent

of normal He was given 2 injections of 300,000 units of procaine penicillin in oil for 10 days on an empirical basis His left arm was elevated on a pillow and an electric pad was used over the affected area. Roentgenograms of his chest, cervicodorsal spine, and left shoulder girdle revealed no abnormalities He was placed on bed rest, but no attempt was made to restrict arm movements Twenty four hours after admission, his temperature was normal and remained so thereafter By the second day practically all pain and tenderness had disappeared and he felt completely well He was released on 29 January He had been subjectively well since the second day of bed rest (the fifth day of the illness), but the swelling had remained unchanged and the superficial veins were still visible

He was followed as an outpatient for 6 months, at the end of which time the swelling noted at admission was practically unaltered but the visible venous channels were much less evident. There had been no recurrence of pain in his shoulder during this period and he was aware of no limitation in movement of the shoulder girdle No objective limitation of motion was demonstrable

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BOOK REVIEWS

Diagnostic Electroencephalography by *Hans Strauss* M D Associate in Neurology in Charge of Electroencephalography Mount Sinai Hospital and Hospital for Joint Diseases New York N Y *Mortimer Ostow* M D Med. Sc D Adjunct in Neurology in Charge of Electroencephalography Beth Israel Hospital Adjunct in Neurology for Electroencephalography Mount Sinai Hospital New York N Y and *Louis Greenstein* M D Adjunct in Neurology for Electroencephalography Mount Sinai Hospital New York N Y 282 pages illustrated Grune & Stratton Inc New York N Y publishers 1952. Price $7 75

The authors have produced a book through which physicians not directly concerned with electroencephalography may inform themselves of its principles and practical application This book is also of use to students prior to beginning actual laboratory training in electroencephalography It is divided into 3 parts covering (1) general aspects of the electroencephalogram, (2) the electroencephalogram in disease, and (3) the diagnostic evaluation of the electroencephalogram A section of illustrations containing 2 graphs and 42 samples of electroencephalographic tracings follows Throughout the text are many tables which are not as easily understandable as might be desired The author

uses an abbreviated classification of records indicated by symbols An example is the sentence One case showed an extremely unusual record with a pattern of an HP f BS D record changing repeatedly within a few minutes to that of an LP D BS D record This sentence and the tables can be understood only by constant reference to a key opposite page 1

—*Col J W Kemble MC U S A*

D ctionary of Civil Defence edit d by *Carlt Wall c* Associ te F ll w I stit te of Ci l D f c 160 pag ll trat d Ph lo phic l Li trary Inc New Y k N Y publ she 1952 P ce $2 75

Although this publication was written primarily as a reference book for members of the Civil Defence Corps in Great Britain a great deal of the information it contains should prove useful to federal civil defense workers in the United States It includes not only instructions for first aid and rescue operations but also descriptions of the various potential warfare agents and their resultant effects The group index for example lists the following major topics (1) agents of warfare (2) atomic warfare (3) fire and fire-fighting (4) first aid (5) gas and gas warfare (6) precautions and protection and (7) rescue operations Each of these topics has many subheadings alphabetically arranged

The information on gas and gas warfare including a well arranged war gas chart, contains data not otherwise readily obtainable except in military publications Much of the material pertinent to fire fighting rescue operations and other civil defense procedures is based on practical lessons learned from the air raids on Great Britain in World War II Some of the descriptions contained under atomic warfare, however, are not in accordance with current views in this country For example it is not thought that treatment for shock will be of any first aid value for uncomplicated radiation sickness nor is it assumed that a person exposed to large amounts of radiation is especially sensitive to heat It certainly will not be necessary for a civil defense worker who has not received in excess of 50 milliroentgens of radiation under disaster conditions to report to a medical officer for examination A description of the Holger Nielsen method of artificial respiration should have been included because it is now believed to be the most efficient method especially when artificial respiration is indicated following nerve-gas poisonin

Despite these defects, however the book is recommended as an additional reference source for all concerned with any of the broad aspects of civil defense because it reflects British experience learned the hard way

—*Commander H S Etter MC USN*

PENETRATING WOUNDS OF THE HEART

JOHN J WELLS *Captain MC U S N* (1)

A PATIENT with a stab wound of the heart that is not immediately fatal has a fair chance of recovery if, on his arrival at the emergency ward of a hospital, the condition is promptly recognized, resuscitative measures are begun, and an operation is performed within from 15 to 20 minutes after admission An understanding of the pathologic physiology of penetrating wounds of the heart, the surgical approach to their repair, and the immediate postoperative care are essential to a successful outcome The surgical staff of every hospital should be able to treat heart wounds competently because no special training in thoracic surgery is required in the emergency care of such a patient A successful outcome is very gratifying to a general surgeon whose experience in cardiac surgery may be limited

CASE REPORTS

Case 1 An 18-year old boy was stabbed in the left anterior chest with a knife about 15 minutes before admission to the emergency ward Examination showed an incised wound, 2 cm long, on the right anterior chest in the fifth interspace, 7 cm from the nipple line The blood pressure was 60 systolic, diastolic not obtainable The pulse was weak, rapid, and thready There was dyspnea The heart sounds were soft and distant The veins of the neck and upper extremities were not visibly distended Resuscitative measures, including intra arterial transfusion of type O Rh_o *negative* whole blood with added Witebsky substances, were begun immediately About 15 minutes after admission, thoracotomy revealed a 1 5 cm wound of the pericardium and a 0 5 cm perforating wound of the left atrium and right ventricle While suturing the heart wounds and directly following cardiac arrest occurred This was combated by vigorous cardiac massage During the operation, the patient received 9 pints of blood intra arterially The postoperative convalescence was complicated by a left hemothorax which required repeated thoracentesis and the use of streptokinase and streptodornase On the second postoperative day the patient developed a

(1) [illegible] Valley Calif

right-sided seventh nerve palsy and a flaccid paralysis of the right forearm and hand The facial paralysis was transient, and steady improvement has occurred with gradual return of full function of the right forearm and hand Electrocardiographic tracings for the first 3 postoperative days were consistent with a pericardial reaction Thereafter the electrocardiographic tracings were normal There is no impairment of the patient s mental faculties

Case 2 A 23 year-old man was admitted to the emergency ward, 15 minutes after a scuffle with an incised wound of the right chest in the sixth interspace 2 cm from the sternum The blood pressure was 110/60 and the pulse was rapid and of good volume Dyspnea was present The heart sounds were regular but distant Percussion revealed dullness of the whole right chest On completion of the physical examination, the patient attempted to arise from the examining table and toppled over dead Autopsy showed a 2 cm wound of the right side of the pericardium a 1 cm wound of the right ventricle and the right pleural cavity completely filled with blood.

DISCUSSION

Pathologic physiology The heart may be injured by penetration through any quadrant of the chest or even through the upper abdomen The most common site of penetration is the left anterior portion of the chest inside the midclavicular line from the second to the seventh intercostal space The weapon most commonly used is a knife a bullet or an ice pick (2) The right ventricle because of its exposed anterior position is most vulnerable next, the left ventricle, the auricles and the aorta A penetrating wound of the chest or abdomen may also injure the lungs the pulmonary vessels the intra pericardial portions of the great vessels, the diaphragm the liver the intercostal vessels or the internal mammary vessels

The essential pathologic physiology in penetrating wounds of the heart is either cardiac tamponade or an exsanguinating hemorrhage into a pleural cavity When the wound in the pericardial sac is small and the heart wound bleeds freely, cardiac tamponade is rapidly fatal A slowly bleeding wound of the heart with a small ball valve opening in the pericardium may allow from 150 to 250 cc of blood to accumulate blood being squeezed through the opening in the pericardium into the pleural cavity with each systole Patient 1 had this type of stab wound Patient 2 presented a briskly bleeding wound of the right ventricle with a large pericardial opening and rapid exsanguination into the right pleural cavity

(2) Gr w ld R. A. d M auls C. H P tr g w d f h rt nd p ard um. Surg Gy & Ob t 4 406-418 F b 1942.

Penetrating wounds of the heart nearly always injure the endothelium with mural thrombus formation, valve and septal perforations, and/or severance of the chordae tendineae of the papillary muscles ECG's are abnormal for the first few days, but rapidly return to normal unless there has been an injury to the coronary vessels or a severe contusion of the myocardium A common postoperative complication of penetrating wounds of the left chamber of the heart is cerebral embolism, and of the right chamber, pulmonary embolism

Diagnosis As pointed out by Elkin *(3)*, wounds by knife or bullet entering "just to the left of the sternum from the second to the fifth rib are most likely to injure the heart" and the direction of the external wound is important in diagnosis, although the course of such a wound may be misleading The important signs and symptoms in the diagnosis of penetrating wounds of the heart are (1) the presence of severe shock in a patient with a small visible wound of the chest or upper quadrant of the abdomen, (2) Beck's *(4)* triad of "a falling arterial pressure, a rising venous pressure, and a small quiet heart," and (3) a wide cardiac shadow with diminished pulsation (which may, however, be absent, as pointed out by Elkin, in case of a rapidly developing tamponade from a small amount of blood) Lacerations of the lungs, unless immediately fatal from injury to large blood vessels, do not usually produce a severe hemorrhage in a short time The hemothroax is conservatively treated by repeated thoracentesis Subsequent exploratory thoracotomy is indicated to rule out hemorrhage from an injured internal mammary or intercostal vessel, or severe laceration of the lung, when dyspnea is present and repeated taps yield large amounts of blood.

Surgical technic Resuscitative measures are promptly begun on the arrival of a patient with a penetrating wound of the chest or upper abdomen in whom the signs and symptoms point to a wound of the heart It has been repeatedly emphasized in the medical literature that if a patient with a penetrating wound of the heart survives a few minutes after arrival at the hospital, prompt diagnosis and surgical intervention can be lifesaving Resuscitation includes oxygen therapy and elevating the foot of the bed It may be necessary to make a pericardial tap prior to transfusion of whole blood in order to gain time in cardiac tamponade although this has its dangers *(5)* Pericardicentesis is easily performed through the left para xyphoid space, maintaining constant suction on the syringe as the needle is ad

(3) Elkin D C [illegible] of heart report of 13 cases J Thoracic Surg 5 590-603 Aug 1936

(4) Beck C S Two cardiac emergencies on the field J A M A 104 714-716 Mar 2 1935

(5) Nigaglioni A O Wounds of heart and dissociation of causes of death Am J Surg 20 515-551 June 1933

vanced The needle is stopped when blood enters the syringe or the heart beat is transmitted to the fingers After a specimen of blood has been taken for typing and crossmatching, an intra arterial transfusion of type O Rh_0 negative whole blood with added Witebsky substances may be started

Intra arterial transfusions will rapidly restore the blood pressure to a life sustaining level in severe shock and hemorrhage whereas the intravenous route may be too slow A rubber hand bulb with or without a manometer, incorporated into an intravenous set is a simple and satisfactory method of giving blood intra arterially The acceptable 2 or 3 minute scrub with G 11 is not omitted by the surgeon and the patient is adequately scrubbed and draped to prevent wound suppuration infected hemothorax and chrondritis Intratracheal nitrous oxide-oxygen ether anesthesia is satisfactory Cyclopropane because it increases cardiac irritability is contraindicated. Controlled respiration by the application of positive pressure on the anesthetic bag by the anesthetist should be adequate to maintain respiratory exchange and prevent tissue hypoxia and acidosis

A linear incision is made in the intercostal space adjacent to the wound of entrance This is usually in the left fourth or fifth interspace The costal cartilages of the ribs above and below are divided For better exposure if time permits a rib may be resected stripping from within outward The anesthetist is informed of the opening of the pleura The collapsed lung exposes the pericardium The tear in the pericardium is identified and enlarged At this time the heart is perfused with 2 per cent aqueous procaine solution in an attempt to depress cardiac irritability incident to handling the heart The heart is inspected and the wounds located If brisk bleeding is encountered, a finger is placed over the wound to staunch the flow but not into the wound as this may further tear the myocardium (_) Heavy silk or No 20 interrupted cotton mattress sutures on an atraumatic needle are used to close the ventricular wounds If a wound is adjacent to a coronary vessel the suture can be placed beneath the vessel Wounds of the atria always penetrate the endocardium and are liable to mural thrombus formation and embolic phenomena An atrium is about 2 mm thick, and tearing may occur in placing sutures To avoid a tear in the atrium the wound may be grasped with a hemostat and tied snugly about the base as it is held upward

Gelfoam is then placed on the wound site and the long ends of the suture tied to hold it in place During the suturing of the heart, cardiac arrest may occur This is vigorously combated by rapid cardiac massage squeezing the heart rhythmically as fast as possible with the hand placed within the chest. The

pericardium is resutured leaving an opening in the pericardium sufficient to allow blood or fluid which may collect to escape (2) Residual blood is evacuated from the pleural cavity and the thoracotomy wound closed, with or without drainage If drainage is used, an 18-gage polyethylene tube is threaded into the pleural cavity by means of a separate trocar incision in a dependent part of the pleural cavity and connected to underwater seal drainage bottles

Penetrating wounds of the left upper abdominal quadrant may injure the abdominal organs of the supracolic compartment, perforate the diaphragm and left pleural cavity, and wound the heart A left upper paramedian incision with extension upward across the costal cartilage into the seventh interspace will provide excellent exposure In the right upper abdominal quadrant, the liver is most commonly injured in penetrating wounds

Postoperative care The immediate postoperative care is directed toward

1 The correction of abnormalities in the mechanics of respiration resulting from pneumothorax, hemothorax, pneumonia, or atelectasis The patient is urged to cough and breathe deeply Oxygen therapy is begun, using a BLB mask or intranasal catheter Oxygen bubbled over a water bottle is preferable to dry oxygen Tracheal aspiration is indicated in at least [illegible] French catheter is passed into either nostril as the catheter is advanced toward the pharynx the patient is asked to say "E," and it usually slides into the trachea, producing a violent cough re

2 The early detection of cardiac arrhythmias or circulation [illegible] electrocardiographic tracings. When the arrhythmia [illegible] pericardiocentesis is indicated.

3 [illegible] to prevent emboli from [illegible] thrombi [illegible] penetrate the endocardium. Later heparin [illegible] to prevent hemorrhage.

4 The [illegible] of the wound, the pleura, or the lung [illegible] antibiotics [illegible] as indicated [illegible]

SUMMARY

[illegible]

BOOK REVIEW

Cor l tive Cardiology A Int grati n f Ca d c F nctio d the M nag ment of Cardia Dis e by *C l F Sbaff* M D F A C P A soc t P ofesso f Cl c l M d c B ylor U t r ity C ll g f M d ci e d *D W Ch pma* M D F A C P A s c ate Pr f or f M d ine B yl r U versity C ll g f Med c e 525 p ge ill tr t d W B Sa ders C Philad lphi P p bl h 1952

This book is noteworthy for its unusual make up The authors present the field of cardiology completely in outline form They state in the preface that it has been prepared as a manual for the student of cardiology and that the method of presentation is designed to correlate the phases of anatomy physiology pathology and abnormal or pathologic physiology that pertain to the diagnosis of cardiac disease This volume probably could best be reviewed by a person just beginning his study of heart disease because a reviewer who has some knowledge of this field is likely to fill in as he reads with his own accumulated knowledge It would be interesting and possibly of value to future writers of textbooks to know whether the neophyte learns more rapidly and more surely from this form of presentation or from books written in the standard narrative style If this type of presentation is more efficient, then a great deal of time and paper can be saved in the future I believe, however that many students are so constituted that a book well written in narrative style with adequate reference to historical development in the field makes a more lasting impression and a better orientated frame of reference than an outline On the other hand this phase of teaching can be supplied by the lecturer and in this event a manual such as this would have great value

Comparison with other books on this subject brings out such defects as relatively few references insufficient description to give a clear picture and some rather dogmatic statement On the other hand there is rather more on the ECG in children than is usually found and the summaries on therapy with side by side comparison of similar drugs is most helpful Going to the index for specific information on the P R interval for example, one can locate the desired information much faster in this book than in 3 books on electrocardiography picked at random The illustrations are all diagrammatic except for a few reproductions of roentgenograms The printing and the pattern used in outlining the material are good

—*Commander R C Parker Jr MC USN*

TRAUMATIC ASPHYXIA[1]

LLOYD M NYHUS *Lieutenant MC U S N R*

ORRIN S COOK *Lieutenant MC U S N R*

OLLIVIER (2), in 1837 first described the condition of traumatic asphyxia to which he gave the descriptive term masque ecchymotique * In 1946 Dwek (3) collected 170 cases reported in the literature Recently Reichert and Martin (4) reported another case and reproduced the condition in experimental animals

Traumatic asphyxia is a condition caused by acute compression of the thorax and upper abdomen over a period of several minutes and is characterized by a typical blue or blue-black discoloration of the face and neck and subconjunctival edema and hemorrhage The discoloration is typically mottled and is more pronounced in the eyelids, and around the nose mouth, and ears The color does not fade with pressure The clavicles as a rule form the lower limit of the process Exophthalmous of a mild degree may be evident The conjunctivas are markedly edematous and there are marked subconjunctival hemorrhages Retinal hemorrhages have been reported and, although blurred vision is fairly frequent no permanent disturbance of vision has been reported The mental alertness of the patient may be temporarily dulled Associated injuries are common

Reichert and Martin (4) postulated that acute compression of the thorax sufficient to cause cessation of respiration over a period of from 3 to 5 minutes would cause a sharp increase of pressure in the superior vena cava Because of the absence of valves in the vena cava and jugular veins this pressure rise is sufficient to cause a reversal of the normal blood flow The resultant discoloration is apparently due to acute venous and capillary stasis not extravasation of blood as this process resolves without going through the usual chromatic changes of hemorrhage The color begins to fade rapidly after the first few days and within 2 weeks has usually disappeared completely Complete recovery is the rule

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(1) U S Naval Hospital Mare Island Vallejo Calif

(2) Ollivier Relation Med cole d'Emeraents Survenus au Champ-de-Mars le 14 Juin 1837 Ann d'hyg 18 485 1837

(3) Dwek J Ecchymotic mask J Internat Coll Surgeons 9 257 265 Mar Apr 1946

(4) Reichert F L and Martin J W Traumatic asphyxia, experimental and clinical observations with report of case with concomitant paraplegia Ann Surg 134 361 368, Sept. 1951

BOOK REVIEW

Co relati Cardiology An I tegrat n of Cardia Funct on nd the M nag m t of Cardia Dis a e by *Ca l F Sbaff* M D F A C P As o t Pr fe o f Cli c l M dic n B yl U v r ity Coll ge f Med e d *D W Ch pma* M D F A C P A o te Prof s of M d n B yl r Un ver ity C ll g f Med c e 525 p g s ll trat d W B Sa der Co Philadelphia P p bl her 1952

This book is noteworthy for its unusual make up The authors present the field of cardiology completely in outline form They state in the preface that it has been prepared as a manual for the student of cardiology and that the method of presentation is designed to correlate the phases of anatomy physiology pathology, and abnormal or pathologic physiology that pertain to the diagnosis of cardiac disease This volume probably could best be reviewed by a person just beginning his study of heart disease because a reviewer who has some knowledge of this field is likely to fill in as he reads with his own accumulated knowledge It would be interesting and possibly of value to future writers of textbooks to know whether the neophyte learns more rapidly and more surely from this form of presentation or from books written in the standard narrative style If this type of presentation is more efficient, then a great deal of time and paper can be saved in the future I believe however that many students are so constituted that a book well written in narrative style with adequate reference to historical development in the field makes a more lasting impression and a better orientated frame of reference than an outline On the other hand this phase of teaching can be supplied by the lecturer and in this event a manual such as this would have great value

Comparison with other books on this subject brings out such defects as relatively few references insufficient description to give a clear picture and some rather dogmatic statements On the other hand there is rather more on the ECG in children than is usually found and the summaries on therapy with side by side comparison of similar drugs is most helpful Going to the index for specific information on the P R interval for example, one can locate the desired information much faster in this book than in 3 books on electrocardiography picked at random The illustrations are all diagrammatic except for a few reproductions of roentgenograms The printing and the pattern used in outlining the material are good

—Commander h C Parker Jr MC USN

HEMANGIOMA OF THE GLANS PENIS

JAMES W LANE *Captain MC U S A R (1)*

THE malignant tumors of the penis are squamous cell carcinoma and sarcoma The types of sarcoma which have been reported are fibrosarcoma, melanosarcoma, Kaposi's sarcoma, round cell sarcoma, and endothelioma Carcinoma of the penis constitutes about 1 percent of all cancers in men, whereas sarcoma is rarer The benign tumors of the penis are squamous cell papilloma, lipoma, fibroma, dermoid cyst, and hemangioma The squamous papillomas, which include condyloma acuminata, are frequently seen in men of military age The other types of benign tumors are uncommon Hemangioma confined to the glans penis is an exceedingly rare lesion In 1948 Mortensen and Murphy *(2)* found 8 such cases reported and added 2 of their own There have been no subsequent reports The following is presented as the eleventh recorded case

CASE REPORT

A 21 year old soldier was seen with a lesion on the glans penis of 2 years duration which had slowly increased in size It had become painful when the penis was erect Examination revealed a slightly elevated, circular lesion on the dorsal portion of the glans penis about the size of a penny It was blue purple and had a rasberrylike appearance It collapsed and blanched on pressure but would refill promptly when pressure was released There were no similar lesions elsewhere on the body, and no family history of hemangiomas

A circumcision was performed because it was believed this would facilitate later healing of the glans Eight days later the hemangioma was excised under local anesthesia A moderate, localized balanitis developed and 6 days later the incision separated Healing was therefore prolonged, but after 3 weeks the area was completely closed, leaving a surprisingly small defect in the glans The patient was seen 6 months after excision and a good functional result had been obtained There was no evidence of recurrence The pathologic diagnosis was cavernous hemangioma

(1) U S Army Hospital Camp Rucker Ala

(2) Mortensen H [illegible] Murphy L Angiomatous malformations of glans penis J U 1 64 396-399 Apr 1950

DISCUSSION

In the previously reported patients good results were obtained by the use of fulguration as well as by surgical excision In one patient radiation therapy was given without any benefit I believe that excision is the best treatment Primary healing would be aided by the use of chromic catgut sutures instead of plain catgut and by better control of postoperative erections

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BOOK REVIEW

Ph rmacology and Therapeutic by *Ch rl Sol m* M D F A C P Lectur r in Med cin Stat U rsity Colleg f Med N w York N Y Att ding Phy cia J wi h H sp t l of B o kly Att d g Physic an J wi h San t r m a d Ho pit l f r Chro c D e Lecturer in Ph ms l gy nd Th rape tic S h l of N sing Jewi h Ho p t l D ct of Gr d t Cour Appl ed Ph rma l gy d Therap utics Brooklyn Coll ge of Pharmacy w th th c llaborat on of *El zab th S G ll* B S. R N l tru t r t Nur s g Dep rtm t of Nur g Fac lty f Med ci Col mb a U ty P e by t n Ho p t l School f Nur ng. 6th dit on 656 page ll tr t d J B Lipp cott Co Phil delphi P p bl h s 1952

This work was primarily meant for nurses It contains many abstracts from the work of others and is mainly a reference guide Dr Solomon appears not to have an ill founded distrust of pharmaceutical manufacturers and the profession of pharmacy o book deals rather with chemotherapy than with pharmacology th the introduction the author stresses the importance of learn ng pharmacology from actual performance using the text only as a guide

Practical pharmacology is designed to enable the student to observe for himself the action of drugs on isolated tissues organs of intact animals and man (with limitations) and to gain facility with the technical methods used The analysis of drug action in man is difficult and only with carefully controlled experimental conditions and the application of statistics to the results can accurate conclusions be drawn In animals adequate doses of drugs may be administered to produce clear-cut effects but in human experiments risks cannot be taken The doses of drugs administered to students are such that the most sensitive student will show no untoward effect. This precaution means that less sensitive subjects may exhibit little or no effects from the drug In spite of this prudent limitation, much useful information can be extracted from human experiments —*First Lieut J A Potts USAF (MSC)*

POSTTRAUMATIC MEDIASTINAL HEMATOMA[1]

JOSEPH M HANNER *Commander* MC U S N

FELIX E GLAUSER *Lieutenant* MC U S N R

BEFORE the advent of roentgenologic chest surveys for large sections of the Armed Forces and civilian population, mediastinal tumors were considered a rarity Because most mediastinal tumors are asymptomatic in their early stages, they often were not diagnosed until growth of the mass caused symptoms, at which time therapy was difficult or futile With the routine use of roentgenograms many more early stage mediastinal tumors should come to our attention

Tumors of the anterior mediastinum are most often dermoid cysts, teratomas, substernal thyroid enlargements, or thymic neoplasms Tumors of the superior mediastinum are often aneurysms, lymphosarcomas, or lymphatic tumors of Hodgkin's disease Neurogenic tumors, particularly neuroblastomas and neurofibromas usually occur in the posterior mediastinum where they frequently arise from or invade the spinal canal The above mentioned tumors comprise most of the mediastinal neoplasms

Symptoms vary widely with the site of the tumor and are, for the most part, caused by pressure, infection, hemorrhage, or malignant invasion In addition to roentgenography, fluoroscopy, bronchoscopy, bronchography, angiocardiography, thoracentesis with microscopic study of the cellular content, superficial lymph node biopsy, and barium studies of the esophagus are useful diagnostic aids Thoracoscopy may be performed, but thoracotomy provides more information with only a slight increase in morbidity

A patient with a tumor of lymphatic origin may be given a trial dose of deep roentgen ray therapy to determine the radiosensitivity of the tumor and to help evaluate the relative merits of roentgen ray therapy and excision Occasionally a tumor may be excised after it has been shrunk by roentgen ray therapy Recovery of neoplastic cells from the bronchus or pleural fluid is a poor prognostic sign and may be a contraindication to excision If excision is contemplated in such a patient it is well to know the extent of invasion and to prepare for a pneumonectomy

(1) U S Naval Hospital Beth U S S *Relief*

A patient with posttraumatic mediastinal hematoma who presented severe symptoms and was treated surgically, is reported

CASE REPORT

A 22 year old Korean was admitted to this hospital on 29 December 1951 complaining of dysphagia, dyspnea, hoarseness cough and pain in the chest In August he had sustained a grenade wound of his upper thorax He was in shock for an undetermined time following injury and was unable to use his voice for 10 days As speech returned, he noted persistent hoarseness A chronic cough developed immediately following his injury Soon afterward he began to experience paroxysms of coughing on swallowing both fluids and solid food Two months after injury he noted pain behind his sternal notch on swallowing solid foods Dyspnea present since injury, was not greatly increased with mild exercise, but was aggravated by swallowing His cough was productive of small amounts of sputum but he denied hemoptysis hematemesis or weight loss

On examination he was found to be well nourished and mildly dyspneic with no evidence of anoxia. Laryngoscopy revealed an abduction paralysis of his left vocal cord There was a well healed transverse wound 1 cm long in the second interspace at the right border of his sternum Lung expansion and vocal and tactile fremitus were normal bilaterally There were a few



F l l the a terop ter or u the obst ctı of the pper th d of the opb g s by a oto d m a be n \ te m ll metall c forei bod s



Figure 2. The mass itself is clearly visualized in the left oblique view. Note the degree of tracheal compression by the mass.

coarse wheezes in both lungs which cleared following coughing. A roentgenogram of his chest revealed several small metallic bodies posterior to the left sternoclavicular joint in the apical segment of his left lung. There was moderate widening of the superior mediastinum. Barium studies (figs. 1 and 2) showed a consistent dilatation of the proximal third of the esophagus. An extrinsic, ovoid mass was situated between the trachea and the esophagus 3 cm. above the bifurcation of the trachea. At the level of the mass the trachea was narrowed to one-fourth of its normal diameter in the anteroposterior plane, with similar esophageal obstruction causing delayed passage of even the thinnest barium mixtures. Bronchoscopic examination confirmed the presence of an extrinsic mass posteriorly causing almost complete tracheal occlusion. The mass contained no air or opaque foreign bodies and did not pulsate on fluoroscopic examination. The edges, although sharp, were broken by consistent pebblelike projections.

On 2 January 1952 a mediastinotomy was performed through a right posterior incision, with resection of the posterior 5 cm. of the third and fourth ribs. An ovoid, organized hematoma, measuring 3 by 3 by 2 cm. and situated between an intact trachea and esophagus, was exposed, aspirated, and incised. The clot, consisting of serous fluid and chocolate colored, old blood, was

removed The anesthesiologists reported an immediate improvement in the ease of the patient s respiration The wall of the mass collapsed, measuring after evacuation, less than 1 cm in the anteroposterior plane The right pleural cavity was inadvertently entered

On the second postoperative day the patient developed a right hemopneumothorax with atelectasis of 75 percent of his right lung, unassociated with dyspnea or tracheal deviation. Two thoracenteses with removal of 800 cc of air and 100 cc of serosanguineous fluid, materially improved the roentgenographic findings At the time of his evacuation to a Korean hospital on 14 January, a small hemopneumothorax persisted, but he was no longer dyspneic, dysphagic, or breathless on swallowin His hoarseness remained unimproved Six months after his operation he was on full combat duty with the Republic of Korea Army

BOOK REVIEW

Forensic Psychiatry by *Henry A Davidson* M D American Academy of Forensic Sciences Fellow American Psychiatric Association 398 pages The Ronald P Co New York N Y published 1952 P $8

Neophytes in forensic psychiatry will read this book with interest and profit. It may well become required reading The first part, "Content of Forensic Psychiatry," includes a wide range of subjects from the hoary but misunderstood and maligned McNaghten formula to a model act for more humane commitment of the mentally ill One finds valuable information and discussion of the legal implications of each important problem with which the psychiatrist is apt to be confronted Crime sex, marriage children injury malingering alcohol, wills contracts and malpractice are dealt with at length The second part Tactics of Testimony is equally valuable The psychiatrist is instructed how to present himself as an expert witness how to make himself understandable to the court and jury and how to meet the challenge of a cross examination There is an excellent legal lexicon for doctors a psychiatric glossary for lawyers and several detailed examination guides which focus on the legal aspects of a case The author is pragmatic and specific throughout the book The psychiatrist will learn nothing of a dynamic nature about psychiatry but he will certainly learn a great deal in a practical way about the relationship of his speciality to the law

—*Commander R D Sherman MC USN*

DENS IN DENTE

ROBERT W DIDION *Lieutenant DC U S N*

DENS in dente is a condition wherein a tooth or toothlike structure grows within the pulp chamber of a tooth This particular condition, first described by Tomes *(1)* in 1859, is rather rare but not as rare as it once was thought to be *(2, 3)* The case here reported would be designated as a coronally generated dens in dente and occurred in the maxillary



Figure 1 Roentgenogram showing dens in dente

second incisor, which is the tooth most likely to undergo this abnormal development *(4)* It is thought that this peculiar condition is the result of an invagination during the developmental period of the tooth

(1) Tom J A Sy tem of Dent l Surgery [illegible] p 266

(2) Th m L H Or l P th logy 2d edition [illegible] 1944 pp 00-203

(3) Sh fer W G and Hi e M K D ns in d nt [illegible] 5 306 314 Mar 1952

(4) Kro f l d R Dens in dent) D n Res arch [illegible] 1954

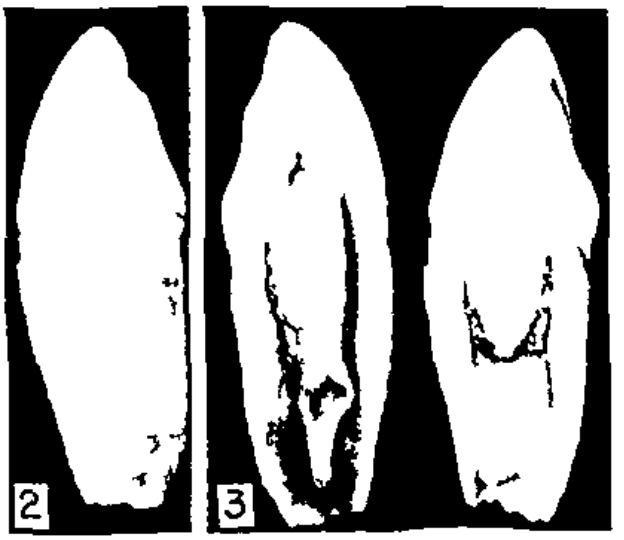


Fig re 2 Upper l ft cond inci r aft r removal Figure 3 S ctio of r mov d tooth

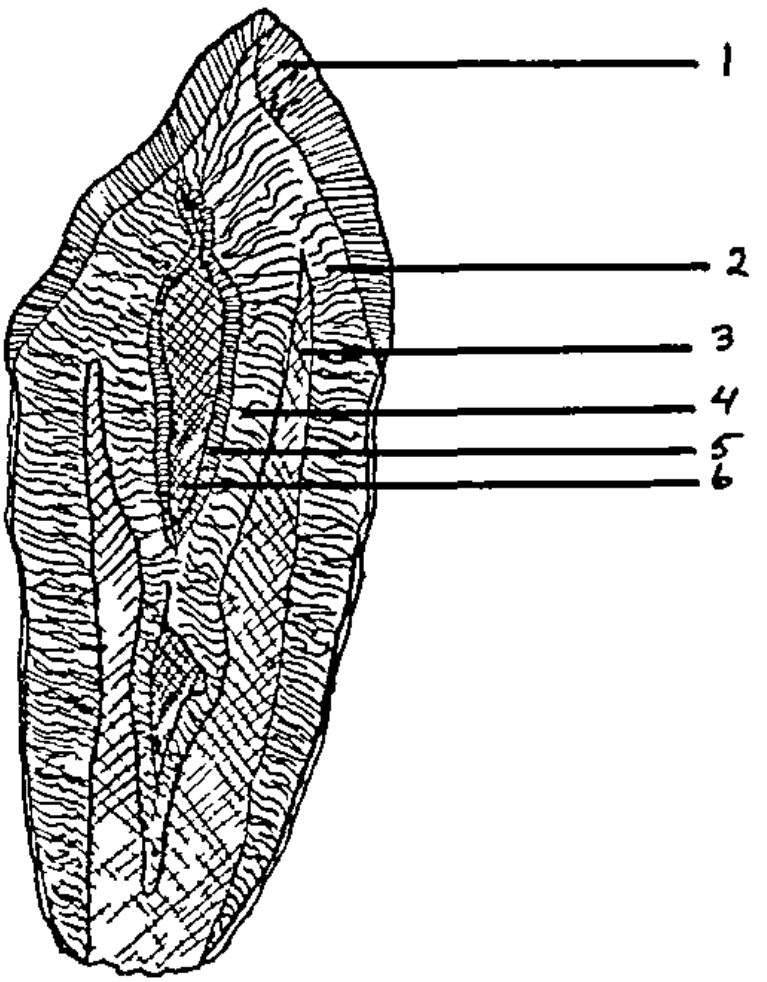


Fig 4 D gram f t o d t th
1 5 am l
2 4 d t
3 p lp
6 d b (p bap m a t of th enam l form g gan)

BOOK REVIEWS

Post-Operative Care by *H. J. B. Atkins, D. M., M. Ch. (Oxon), F. R. C. S. (Eng.)* Surgeon and Director of the Department of Surgery, Guy's Hospital 4th edition 338 pages Illustrated Charles C. Thomas, Publisher, Springfield Ill. 1952 Price $6.75

The author states in his introduction that frequently the busy surgeon, operating in many hospitals, often some distance from his home, does not have the opportunity to supervise the after treatment of all his patients personally. This book was written to guide those who must care for such patients postoperatively. It is directed toward helping the general surgeon and his assistants rather than those engaged in highly technical specialties. The first chapter, entitled "Early Postoperative Treatment," covers a number of usual and some unusual conditions. The fluid and electrolyte balance is not covered in detail, but the section on position in bed is most interesting and worthwhile. Wound healing, infection, and antibiotic therapy are discussed in a very readable manner. The care of patients following thyroid and breast operations is only briefly described, but most of the important problems and complications are touched on. The chapter on the chest is definitely written for the general practitioner and does not encroach on the thoracic surgeon's field. An

be expected the chapter dealing with the postoperative care of the abdomen gives more detail than the others The postoperative medication and diet following repair of a perforated peptic ulcer and other gastric operations is especially good A brief review of the biliary system covers most of the more frequent complications experienced in this field Intestinal resections enterostomies ileostomies colostomies and fistulas are briefly dealt with

Other chapters are devoted to the ear nose and throat and to the genitourinary system The latter is of interest to the general surgeon because of the frequent postoperative complications that develop in this field even when the original operation or injury involved another part of the body Amputations of the limbs and fractures are discussed in a satisfactory manner A good portion of this material is credited to Watson Jones There is an excellent chapter on rehabilitation, an appendix on writing reports and another on appearing in court. The average American reader will find a number of medicinal preparations listed under names that will be strange to him

—*Capt G A Gray MC USN*

Essentials of Infant Feeding for the Physician A Practical Text for Rapid Reference by Hiram Frederick Myers A B M D Assistant Professor of Pediatrics Northwestern University School of Medicine Associate Attending Physician Children's Memorial Hospital Chicago Ill Courtesy Attending Physician Evanston Hospital and St Francis Hospital Evanston Ill 252 pages illustrated Charles C Thomas Publisher Springfield Ill 1952 Price $6 75

The author's purpose in compiling this manual is to present the application of the practical principles of chemistry and physiology to the art and science of infant nutrition In this he succeeds He presents briefly the chemical and physiologic principles underlying infant feeding and illustrates how such principles can be achieved through the use of available preparations His impartial listing of all the commercial preparations is of exceptional value for together with the names (in themselves confusing) he presents the chemical constituents cost, and indications for uses Given in tabular form the similarities between the various preparations become apparent and he finishes this section of his book with the advice to the physician to pick 2 or 3 from the list learn how to use them and then forget the rest This forthright approach characterizes most of the material presented The author discusses such controversial issues as demand feeding and psychic factors in feeding without recommending a definite stand. This is, perhaps, the only drawback to what is otherwise a complete and handy reference work —*Capt D Stowens MC USA*

RUPTURE OF SPLEEN IN PATIENT WITH MALARIA[1]

FLORENTINO PEREZ PINA *Captain, MC, U S A R*
JAMES B HARTNEY *Major MC U S A*
SOLOMON L ZIMMERMAN *Lieutenant Colonel MC U S A R*

DURING World War II, malaria was a major military medical problem During the present Korean conflict it has likewise become apparent that the hazard of malarial infection in our troops is significant An editorial report 1 year ago put the number of Korean veterans with malaria reported to that time at 6,500 *(2)* At this hospital 143 patients with malaria have thus far been treated Most of these men had received suppressive chloroquine therapy and had not experienced clinical symptoms prior to their return to the States The patient here reported was one of these That rupture of the spleen occasionally occurs should be borne in mind A similar case was reported recently *(3)* Prompt recognition of this grave complication is essential The decisive results of early surgical intervention in this otherwise uniformly fatal condition are among the most gratifying which surgery has to offer

CASE REPORT

A 22 year-old man was admitted to this hospital on 27 July 1951 while on leave after being returned to the States on 25 June from Korea on the rotation plan On 17 July he began to have a continuous dull ache in the left upper abdominal quadrant This fact was not elicited until a few days after admission On the same day he developed a severe throbbing headache, followed by shaking chills profuse sweats, and fever, accompanied by vomiting He had 3 such episodes prior to admission and in the intervening periods felt fairly well On the evening of admission, while sitting in a chair, he had a sharp pain in the left shoulder but this was not severe enough for him to mention to the admitting physician He denied trauma of any kind to the abdomen or elsewhere He had no previous history of malaria He had been in combat in Korea from July 1950 to June 1951 While in Korea, he took 1 tablet of chloroquine weekly from 23 July 1950 until the end of April 1951

(1) Murphy Army Hospital Waltham Mass
(2) Editorial Meeting of Military Surgeons J A M A 147 762 Oct 20 1951
(3) Shimm R C Lanard F W and Wilker D C Spontaneous rupture of pathologic spleen report of case J A M A 149 660-661 Jun 14 1952

On admission his temperature was 101 6 F His pulse was 90 His scleras were slightly icteric His liver and spleen were not palpable Some direct tenderness was noted in his left upper abdominal quadrant Blood smears showed ring and ameboid forms of *Plasmodium vivax* His hemoglobin was 10 ? grams per 100 cc His erythrocyte count was 3 770 000 His hematocrit was 39 percent His urine contained 3 plus sugar due to intravenous infusions of dextrose Subsequent urinalyses were negative for sugar His direct serum bilirubin was 0 5 mg per 100 cc indirect 1 4 mg per 100 cc His cephalin flocculation was 4 plus after 24 and 48 hours

On admission he was put to bed and treatment with 10 mg of pentaquine and 0 6 gm of quinine sulfate every 8 hours was started as soon as the diagnosis of malaria was made At about 1015 hours on the day after admission he was found to be extremely pale restless and perspiring profusely On questioning he complained of severe pain in the left upper abdominal quadrant and nausea He was obviously in shock as the result of peripheral vascular collapse His pulse and blood pressure were unobtainable for a few minutes and his heart sounds were distant He was slightly hyperpneic Immediate emergency treatment consisted of shock blocks 5 cc of coramine and 1,000 cc of 5 percent dextrose in saline solution given quite rapidly by vein The patient rallied and his blood pressure rose to 80/40 within 15 minutes and later to 112/58 His profuse sweating ceased and the nausea abated. Examination at this time showed a completely relaxed abdominal wall with normal peristaltic sounds There was no distention but some tenderness was still present in the left upper quadrant The liver and spleen were not felt. There was no shifting dullness Examination showed an empty rectum A fleck of stool obtained at that time was negative for occult blood by the guaiac test

To explain this episode of sudden shock several possibilities including severe infection with *Plasmodium falciparum* were considered This was not confirmed by careful re-examination of his blood smears The other strong possibility considered was spontaneous rupture of an enlarged malarial spleen The relatively minimal findings on abdominal examination were misleading in the light of subsequent findings This second possibility was kept in mind however and the patient was carefully watched with frequent pulse and blood pressure determinations and hemograms while donor blood was being typed and cross matched About 90 minutes after the original episode the pain spread to the remainder of the abdomen especially the right upper quadrant, and he vomited some bile-stained fluid which contained no gross blood The abdomen at this time showed generalized pasm with moderate rebound tenderness the tender

ness was maximal in the upper quadrants. Peristalsis and bowel sounds were absent. Although the spleen was not palpable and no other masses were felt, the entire abdomen was dull to percussion, whereas 90 minutes before it had been tympanitic. The blood pressure varied between 90/40 and 112/60.

A definite diagnosis of spontaneous rupture of the spleen was made at this point and the patient was taken to the operating room where under general anesthesia, the abdomen was entered at 1440 hours. On incision of the peritoneum, a large quantity of dark blood escaped. The splenic pedicle was soon located and tightly held by the surgeon to prevent further bleeding.



Figure 1 Gross appearance of spleen showing extensive laceration near the hilus.

A large amount of liquid blood and many blood clots were then evacuated from the abdomen, revealing the spleen to be ruptured on its superior medial surface (fig. 1). The spleen was removed. During the operation and postoperative period the patient received a total of 2,000 cc. of whole blood. The postoperative course was uneventful. [illegible] and there were no more [illegible] blood smears were obtained and the patient was discharged.

The pathologist reported that the [illegible] and measured 13.5 by 9 by [illegible] an irregular jagged laceration [illegible] splenic capsule was fairly smooth [illegible] few

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surface and in Giemsa stained tissue sections Parasites could not be demonstrated within cells of other types or free within the sinusoids

DISCUSSION

Pathologic findings The findings in the ruptured spleen of the patient with relatively acute malaria have been reviewed by Hershey and Lubitz *(4)* and Lubitz *(5)* In the earlier publication *(4)*, the finding of thrombuslike formations in small veins, with endothelial swelling and subintimal infiltration was stressed This was in accord with Rigdon's *(6)* view of the pathogenesis of splenic infarction, based on his studies of the spleen in birds and monkeys with experimental malaria, and in human patients with falciparum malaria Lubitz *(5)* restated the view that vascular alteration is a predisposing element in rupture, with the additional statement that rupture is preceded by subcapsular hematoma This was emphasized by Smith and Custer *(7)* in their studies on the spontaneously ruptured spleens of patients with infectious mononucleosis

The histologic findings reported in the ruptured malarial spleen have been grouped by Lubitz *(5)* as phagocytic, degenerative, proliferative, and hyperplastic cellular changes (all of which were evident in our patient) and vascular changes Vascular changes identical with those which he described were present in this spleen but the close spatial relationship between obstructive vascular lesions and areas of necrosis was not striking here Venous obstruction was not demonstrated near the subcapsular hematomas It is suggested that the marked cellular hyperplasia and vascular engorgement may produce sufficient mechanical distention partially to disrupt the capsule and trabeculas, with secondary lymphocytic infiltration of the damaged areas The predominantly subcapsular location of areas of hematoma formation may be associated with the relatively unyielding character of that structure and its failure to expand at the same rate as the underlying pulp cords The resultant separation of cords from the capsule might be regarded as the proximate initiating factor in the development of the subcapsular hematoma which is generally accepted as a preliminary to rupture

Clinical problems Rupture of the spleen may be one of the most dramatic of all intra abdominal accidents Its prompt rec-

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(4) Hershey F B and Lubitz J M Spontaneous rupture of malarial spleen report and analysis of 64 reported cases Ann Surg 127 40-57 Jan 1948

(5) Lubitz J M. Pathology of ruptured spleen in acute vivax malaria Blood 4 1168 1176 Oct 1949

(6) Rigdon, R H Consideration of mechanism of splenic infarcts in malaria Am J Trop Med 24 349-354 Nov 1944

(7) Smith E B and Custer R P Rupture of spleen in infectious mononucleosis clinicopathologic report of 7 cases Blood 1 317 333 July 1946

ognition or the suspicion of its having occurred in a patient presenting certain clinical features is imperative if the patient is to be saved The mortality is practically 100 percent in patients who are not operated on In those operated on the mortality increases in proportion to the time lag between the occurrence of the rupture and surgical intervention The only treatment is prompt splenectomy The list of causes of rupture of the spleen is growing Spontaneous rupture of the normal pleen has been alleged to occur but this is not generally accepted In most such patients trauma accounts for the rupture Conditions in which rupture of the spleen occurs with minimal trauma are malaria, typhoid fever cirrhosis of the liver infectious mononucleosis influenza, leukemia and kala azar Malaria is by far the most common cause of spontaneous rupture of the spleen

Until 1916 only 136 cases of rupture of the spleen in patients with malaria had been reported *(4)* Considering the fact that about 300 000 000 cases of malaria are estimated to occur annually in the world these figures indicate that this complication is relatively rare Many cases of splenic rupture however are undiagnosed and unreported and others are diagnosed but not reported

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BOOK REVIEW

The N wer Knowledg of Hyg ene n D t by J S m Wall c M D C M D Sc L D S F D S R C S Eng F A C D V c P s d nt f the Food Ed cat on So iety H F llow Society of M O H (Ne ch Pr 1928 29) H M mb B D A P st P d t f the B t Soc for the Study of Orthod t Em ru L ture t P t D nt stry K g's Coll g Ho p tal Forme ly D tal Surg nd L cturr on Dental Surg ry d P th logy L d H pital John T m Pr (1918 21) nd Ca rwr ght d dal d P iz (1920 25) R C S E g 264 pag De t l Items f l r t P bli hing Co I Bo klyn N Y p bl h 1952

Unfortunately the author s death preceded the publication of this book which presents a comprehensive selection of what has been written about the relation of diet to dental caries This comprises only a small part of the volume which is concerned mostly with the author s conclusion that the incidence of dental caries and malocclusion among the white races is steadily increasing This book is a continuation of the subject discussed by the author in 4 preceding books The book is not cluttered with graphs or illustrations but is designed for easy reading and contains an extensive bibliography The author has succeeded in providing a complete review of his ubject.

—*Capt T D Pryse USAF (DC)*

Pelvic examination revealed a moderate erosion and earring from old lacerations of her cervix Her uterus was retroverted but otherwise normal There were no tenderness or masses in the adnexa or the posterior cul-de-sac Rectal examination confirmed the pelvic examination A roentgenogram of her abdomen revealed a metallic ring in the right lower quadrant (fig 1)



Fig 1

Intravenous ureterograms revealed normal outlines of her ureters and that the ring was not encroaching on her right ureter Her uterus was injected with a radiopaque oil and utero salpingograms were taken The radiologist reported a metallic foreign body in the right lateral portion of her pelvis lying about 4 cm from the midline of her uterus On the lateral view in the plane of her uterus it appeared to be in the broad ligament. A barium enema revealed that the foreign body did not lie within the lumen of the bowel

The pelvis was explored through a midline suprapubic incision Within the right broad ligament below her right ovary and under the posterior fold of the peritoneum a flexible metallic ring pessary could be felt. By making a linear incision in the peritoneum over the pessary it was caught with a clamp and because of its flexibility it was easily removed It was about 3 5 cm in diameter and made of coiled gold wire Her appendix was removed because it was retrocecal and kinked in the center by old adhesions

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Monthly Message

The medical care of Armed Forces dependents has become a hotly debated issue in certain recent discussions of military medical problems. This revival of interest is due in large part to the need for a re-evaluation of medical manpower requirements in light of the necessity for a continuation of the doctor draft law. There are those, and we do not question their sincerity, who are endeavoring to fuse these two problems into one, even to the extent of refusing support to the extension of a draft measure unless certain factors of dependent care are modified. Were it possible to remove entirely the necessity for a draft law by eliminating medical care for dependents, then there might be reason to consider such a stand. It has been demonstrated clearly, however, that this would not result and that the care of dependents represents only a fraction of the projected medical work load during the present period of national emergency.

Whether or not we are faced with the issue of drafting doctors, there still exists a very real problem in dependent care, a separate and distinct matter of extreme importance, the effects of

which on the lives of those in uniform and hence the national security run through the very warp and woof of the foundations of our Armed Forces A matter of such far reaching significance warrants an exhaustive study by a commission made up of members of the highest national reputation and integrity—civilian and military doctor and layman The Armed Forces neither have the inherent right nor the desire to use the question of dependent care as a bargaining commodity in a hasty effort to redeem as it were this hostage held as security for the support of another important legislative measure

We might well pause in serious reflection before encumbering the doctor draft law with prohibitions relative to dependent care for such limitations might work serious professional educational and geographic restrictions on certain categories drafted into the Armed Forces As a medical reserve officer recently stated a practice limited primarily to young men would certainly produce a serious degree of professional dissatisfaction

Never before in our military medical history has there existed such a high level of professional achievement and never before have the bonds of sincere mutual interest and respect between civilian and military professions been so strong In the interests of the further advancement of our medical status and to further strengthen our national security there is urgent need for clear unprejudiced thinking on the part of the leaders of American medicine both in and out of uniform lest we in hasty action jeopardize our present high level of accomplishment The doctor draft law must be settled on its own merits and the introduction of dependent care into the debate will serve only to cloud the issue inasmuch as the latter is a distinct and separate matter deserving consideration in its own rights

Melvin A Casberg *M D Chairman*
Armed Forces Medical Policy Council
Office of the Secretary of Defense

THE EDUCATIONAL SYSTEM FOR REGULAR ARMY DOCTORS

GEORGE E. ARMSTRONG *Major General* MC, USA (1)

THE present postgraduate educational program for medical officers of the Army is in striking contrast to that in effect at the turn of the last century. Prior to that time no planned training programs were conducted for Army medical officers. Armed only with his basic medical education and such professional experience as he might have had in civil life, a physician was commissioned in the Army and given a duty assignment. In some instances this permitted him to work under the guidance of experienced medical officers but frequently he was thrown entirely on his own resources.

Establishment of the Army Medical School in Washington, D. C., in 1893 by Surgeon General Sternberg was the first step toward the development of formalized postgraduate education. The curriculum of the school placed primary emphasis on professional subjects including tropical diseases, and devoted some attention to medicomilitary matters. General Sternberg was also responsible for the establishment of organized Army medical research programs conducted by specially selected boards and commissions the most famous of which was headed by Major Walter Reed. Thus, General Sternberg may be credited not only with recognizing the fact that military medicine presents problems somewhat foreign to those of civilian medicine in the United States, but also with establishing both teaching and research programs stemming from that basic premise.

The next step in the development of formalized teaching took place in 1911 when the precursor of the Medical Field Service School was established as a part of the Fort Leavenworth school system. Based on the medical experience of World War I, the Medical Field Service School was reorganized in its present form in 1921 at the former Carlisle Indian School, Carlisle Barracks, Pa., where it remained until after World War II.

During the interwar period the Army Medical School and the Medical Field Service School supplied most of the medical military training for medical officers of the Army. Soon after being commissioned in the Regular Army, young medical officers

(1) Surgeon General, Department of the Army, Washington, D. C.

were assigned to 9 months of intensive training divided equally between these 2 schools The Army Medical School concentrated on professional subjects with emphasis on diseases in which the military environment presented special problems The Medical Field Service School, on the other hand, provided training primarily in administrative and field medical subjects

In addition to the 9-month basic course medical officers were required to attend an advanced course at the Medical Field Service School or take a correspondence course as a preliminary to examination for promotion to lieutenant colonel Subject material in both courses related primarily to command and staff work. Some specialized advanced courses on professional subjects were given at the Army Medical School but these were attended by relatively few members of the Medical Corps A small number of officers were also given the opportunity to pursue courses at civilian institutions in public health and kindred subjects Some medical officers took short courses in professional specialties at their own expense In general, however there was no organized program of education beyond the courses described to assure continued professional advancement of the Medical Corps

World War II required drastic modifications of the Army Medical Service educational system Short intensive orientation courses were conducted for large numbers of doctors from civil life who had to be placed on duty with the least possible delay In addition to such basic orientation many short courses in varied professional and administrative specialties were organized

At the end of World War II we faced an entirely new situation Most of the Reserve officers who had served during the war returned to civil life and the Regular Corps was thinned by deaths retirements and some resignations Practically all Regular Army physicians had spent the war in command and staff assignments and had been out of close touch with professional work Thus we had simultaneously to (1) continue to furnish medical service to an Army which, while small in comparison to its size during World War II was far larger than the prewar Army (2) provide professional training and refresher courses to members of the Regular Army Medical Corps and (3) attract highly qualified young doctors to the Army

We decided that the solution to these problems was an aggressive program of professional education designed to raise the quality of medical service in the Army Accordingly, an extensive residency training program was established in selected Army hospitals The Army also sponsored residencies in civilian hospitals Military and civilian internships were established

Professional refresher courses in civilian institutions were provided for members of the Medical Corps Finally, courses in basic sciences were established

This program was designed not only to provide professional retraining of experienced medical officers, but to qualify larger numbers of our physicians for certification by American Specialty Boards This was necessary to meet the needs of an Army of the planned peacetime size Thus, some features of the program were immediate and relatively temporary in nature while others were long-range Concurrently with the establishment of a professional educational program, we recognized the necessity for reviewing our training of medical officers in medicomilitary matters, including administration and the military application of clinical subjects

In the military field a newly commissioned medical officer requires familiarization with the organization and functioning of the Armed Forces and the relationship of the military medical services to other elements of national defense Professionally he requires additional instruction in preventive medicine, tropical medicine, and such military medical problems as shock, battle wounds, burns, cold injuries, and the care of mass casualties He also requires orientation in military psychiatry and in chemical, bacteriologic and radiologic warfare Such basic training should be given at the outset of a medical officer's career, for unless he has this training his value to the service is greatly reduced

With these objectives in mind, we developed basic and advanced courses at the Army Medical Service Graduate School in Washington and at the Medical Field Service School, at Fort Sam Houston Tex The basic course for young medical officers, the company officers course, is in 2 phases, each of about 5 months' duration The first phase, dealing primarily with military and field subjects, is conducted at the Medical Field Service School, and the second phase, concentrating on professional subjects, is given at the Army Medical Service Graduate School Advanced courses are provided at each school Although plans for these courses were developed soon after World War II, it was not until the fall of 1951 that enough Medical Corps officers could be spared from strictly professional training and duty assignments to attend the company officers' course During this time, every effort was made to continue at full capacity the professional educational program

The outbreak of hostilities in Korea in the summer of 1950 necessitated a temporary contraction of the residency program Many residents had to be withdrawn from training and assigned to the Far East because of the urgent need to provide an ex

panded Medical Service About 1 year later however the resi dency program was again fully staffed.

Whereas in 1946 and 1947 there had been hope that world peace was attainable and that we should have a relatively small military establishment, by 1951 it had become evident that a long period of international unrest and a large Army could be anticipated for many years to come Continued compulsory service of doctors appeared inevitable We assumed that for an indefinite period medical service would be supplied to the Army by a relatively small Regular Army Medical Corps and a much larger number of Reserve officers on relatively brief periods of active duty To deal with this situation I appointed a board of senior officers in January 1952 to review our educa tional system

The problem which the board faced may be stated simply in view of the continuing necessity for the utmost conservation of medical manpower what essentials must be taught to the Regular Army medical officer both in the professional and military areas? The board recognized that maintenance of the highest professional competence is the primary objective of all training for Regular Army medical officers Proficiency in the military aspects of medicine including field operations is also essential

The following recommendations of the board have been approv ed and will be put into effect.

1 The military residency program should continue without retrenchment to assure an adequate number of highly qualified specialists

2 The company officers course should be reduced to 2f weeks and conducted entirely at the Medical Field Service School It is now 40 weeks long and split between Fort Sam Houston and Washington This change will result in a great saving in time personnel and money Shortly after we had decided on this change the Department of the Army directed that all branch company officers courses be limited to a maxi mum of 27 weeks In other words the General Staff and my office had independently arrived at the conclusion that company officers courses should not exceed 6 months

3 The advanced course should be given at the Medical Field Service School This course provides advanced branch training in the tactical and administrative duties of field grade officers prior to the twelfth year of their service It familiarizes them with problems in command and staff they will encounter as senior officers

4 The basic science course should be recast to train carefully selected physicians in scientific research instead of serving as an intensive preparation for Regular Army medical officers seeking certification by American Specialty Boards Education in the basic sciences continues to be an essential part of residency training, but the board proposed that residents get this as a part of the regular residency training, rather than in a single concentrated course As presently envisaged, officers selected for the course will be given an opportunity to develop in the fields of research and highly specialized clinical work

5 A short course for hospital commanders should be developed In the event of full mobilization members of the Regular Corps should be able to open new hospitals and administer them, leaving most of the purely professional jobs to physicians from civil life with little knowledge of Army management methods

6 A preventive medicine course of about 9 months should be developed by the Army Medical Service Graduate School and the Preventive Medicine Division of my office This instruction would be the equivalent of a public health course in a civilian medical school We hope to begin the first such course in September 1953

7 A short refresher course in professional subjects should be organized for senior medical officers and given at the Army Medical Service Graduate School This course would probably be only a few weeks long and would be held once or twice a year Most students would be senior officers whose normal duties are outside the strictly professional field, although physicians in such highly specialized fields as ophthalmology might also attend Officers would attend this course on temporary duty status and would repeat it every 3 to 5 years

As a result of my study of the board's recommendations, I have appointed another committee to give detailed consideration to the curriculums of the various courses in our 2 principal schools Before reaching a final decision on the board s recommendations, I called a meeting of our Advisory Board of Civilian Consultants, together with other prominent civilians in the field of medical education This group expressed unqualified concurrence in the proposed educational program I believe the recent study of the Army educational system for doctors has been worth while and will enable us better to fulfill the mission of the Army Medical Service

BOOKS RECEIVED

Oestrogen nd Neoplasi by *Har ld Burrou* a d *E c S. Horn g* With contri b t on by *W C. J Ross* and *C. W Sh pp* 189 pages llu tr t d Charles C Thoma P blish t Springf ld Ill 1952 Pr e $6 75

De matology E e t ls of Di gno s nd Tr tment by *ha ton B. S l be g* M D Prof s or d Ch irman Depa tment f Dermatology d Syphi lology New York U i rs ty Po t-G duat Medic l School Director of Dermatology d Syphilol gy Sk n nd Ca c U t nd U i ersity Hospital New York U ty B lle ue Med c l Ce t Capt i MC U S N R a d Con lt t Dermat log t t th Bur u of Med ci e and Surgery U t d St tes N vy nd *J ck Wolf* M D A sociat Pr f sor f Cl l De matology a d Syph lology N w York U ity Po t Grad te Medic l School Atte d g Dermatol gi t nd Syph l l g t Sk nd Ca er U t a d U e ty H p t l New York U iv ity Bell vue Medi al Ce t 592 pages ll tr t d Th Ye r B k Publ shers Inc Ch c g Ill p bl sh 1952 Price $10

The Physi log c Effects of W und by *th Board f tbe Study f the Se e ly Wound d North Afri a Med t rr a The te f Op r t ons* Medical Department Un t d St tes Army Surgery in World War II 376 pag s llustr t d Off e of th Surg Ge er l Department of th Army W sh gton D C 1952

Pract c l Blood Groupi g M thod A Manual of Imm oh matology by *R bert L. Wall* M D Depa tme t of Re ea ch Medi i The Oh o Stat Un v s y Ho p t l Col mbus Ohio Formerly Blood R earch Se t on Depa tme t of Bi log c Prod ts Army Med l Department R rch nd Gr duate School W h gton D C Publ tion Number 122 Amer Lectur Seri A Mon graph in The Bannerstone D vi on f Americ Lectur Hemat logy Edit d by *R s ll L. Had n* M D Formerly Ch ef of the Med c l Di ion Cle l nd Cli c Cle e l nd Oh 175 pag s Charle C Thoma Publ sh Spr gfield Ill 1952

Th 1952 Year Book of Pediat cs (J ne 1951 May 1952) ed ted by *Syd y S G llis* M D A ista t Prof sor of Pediatri Hi rvard Med l School Se or Phy cia Ch ldr n Medi l Cent Bo ton Pediat i cia n-Ch f Beth Israel H p t l Bost *I aa A. Abt,* M D Ed tor Eme tus 423 pag llustrat d The Y r Book Publisher In Ch c g Ill publ he s 1952 Pric $5 50

Cong t l A omalie of th Heart a d Gre t V ss l by M ur c A. Schn ke B S M D F A C P Lt Col AUS Med c l Cons lt nt Pac fic Th ater World War II Director f Medic St V ce t a Hosp t l Sen or A t Staff Toled Ho p tal nd Maumee Valley Hosp t l Cons lting St ff St Luke Hospital nd Toledo St te Hospit l 306 pages llustrat d Oxford Uni rsity Pr s N w York N Y publishers 1952 Pr e $8

Ophthalmic Pathology An Atla nd T tbook by *Jona S F i d nu ld H l nor Camph ll W ld A Edu d Ma me T E Sand s J h E L. K y M cha l J H ga W C. Ouv nd Ella U Ouens* W th the editorial st c f *H le K ght St ward.* P bl shed und r the jo nt spon orship of the *Ame Acad my of Opbtbalmol gy a d Otolary g l gy* nd th *Armed For Inst tut of P thol gy* 489 pag s illustrat d W B Saund s C Philadelph P publ sher 1952

THE PHYSIOPATHOLOGY OF FROSTBITE

A Conjecture on the Development of Dry vs Wet Gangrene

DOMENIC A VAVALA *Second Lieutenant USAF (MSC)* (1)

VASOCONSTRICTION is a protective mechanism for maintaining a constant body temperature Shumacker (2) stated that the degree of vasoconstriction varies according to the susceptibility of a person's vasomotor responses, the amount of body surface exposed, and the intensity of the cold According to Lewis (3) the mechanisms involved are (1) a local vasoconstriction which is the direct effect of the cold on the blood vessels, (2) a local reflex vasoconstriction mediated via the sympathetic nerves, and (3) a generalized vasoconstriction resulting from the action of the chilled blood on the vasomotor center Thus, the cold stimulus acts not only locally and directly, but also centrally and reflexly The second reaction can be demonstrated if a limb is cooled while its circulation is cut off The result is an immediate and transient general vasoconstriction in the limb (4) The third reaction is observed when the circulation to the cooled limb is restored, producing a generalized and persistent vasoconstriction (4)

On exposure to cold there is an immediate peripheral vasoconstrictor response (2 3 5, 6) This observation was again confirmed in patients with frostbite by the Cold Injury Research Team of the Army Medical Research Laboratory, Fort Knox, Ky , in the Osaka Army Hospital, Osaka, Japan, during the winter of 1951 1952 Patients were allowed to become adjusted to a room temperature of 72 F for 1 hour and then were moved into a

(1) U S Air Force School of Aviation Medicine Randolph Air Force Base Tex Former physiologist Army Medical Research Laboratory Fort Knox Cold Injury Research Team Osaka Army Hospital Osaka Japan

(2) Shumacker H B Jr Injuries due to cold with particular reference to frostbite and trench foot War cons n M J 46 317 324 Mar 1947

(3) Lewis T Observations on some normal and injurious effects of cold upon skin and underlying tissues reactions to cold and injury of normal skin (Hunterian Lecture) Brit M J 2 795-797 Dec 6 1941

(4) Pickering G W Vasomotor regulation of heat loss from human skin in relation to internal temperature Heart 16 115-135 July 1932

(5) Davis L Scarff J E Rogers N and Dickinson M High altitude frostbite preliminary report Surg Gyn & Obst 77 561 575 Dec 1943

(6) Fredman N B and Kritzler R A Pathology of high altitude frostbite Am J Path 23 173-187 Mar 1947

walk in refrigerator in which the temperature was thermostatically maintained at 50 F Skin temperature readings of the patients taken at room temperature and immediately on entry into the refrigerator demonstrated an immediate response to cold by an abrupt fall in skin temperature The fall in skin temperature reflected the vasoconstrictor response

The acute stage of frostbite is manifested by pallor resulting from the vasoconstriction which may persist for 24 hours or longer Davis et al *(5)* reported that direct microscopic examination of the terminal capillary beds in human finger tips soon after exposure to intense cold showed the peripheral ends of the arterioles to be well filled with blood and the terminal capillary loops to be empty Thus if the capillary beds have been deprived of their blood supply by the spasm of the terminal arterioles the pallor observed in the acute stage is understandable The degree and duration of the vasospasm determines the amount of damage inflicted on the involved tissues Severe damage to the endothelium of the terminal capillaries may result in pathologic permeability of the capillary walls as evidenced by the presence of edema This was a frequent finding in patients with fourth degree frostbite incurred in Korea during the winter of 1950 1951 The vasoconstriction resulting from exposure to extremely low ambient temperatures or prolonged exposure to cold may be severe enough to cause tissue death from ischemia Siegmund *(7)* named 5 investigators who observed the development of frostbite in infantrymen and flying personnel of the German Army and Air Force soon after exposure to cold, and all agreed that the tissue changes were caused by anemia due to arterial and capillary constriction Friedman and Kritzler *(6)* attributed the pathologic changes occurring in lesions of high altitude frostbite to ischemia rather than to direct freezing of the tissues

One of our patients was admitted with a diagnosis of fourth degree frostbite of the right foot As a result of shell fragments in the left thigh with injury of the left peroneal nerve the patient was completely immobilized on the ground for 60 minutes at an ambient temperature of from 4 to 2 F Apparently the nerve injury of his left leg prevented a vasoconstriction of the same magnitude as was present in his right foot Thus his injured leg received adequate circulation and sufficient heat to ward off frostbite

Hyperemia, which follows the vasoconstrictor or prehyperemic stage occurs during the thawing period and is followed by extravasation of blood and plasma through the damaged capillary walls This results in blisters and in extensive edema of the

(7) Siegmund J P hol gy f g l d lo l fr b j h k f ar l F b ld 34 9-19 J 1943 (T l t)

affected tissues This stage of reactive hyperemia is thought to be partially due to the local liberation of histamine or a histamine-like substance *(2)*

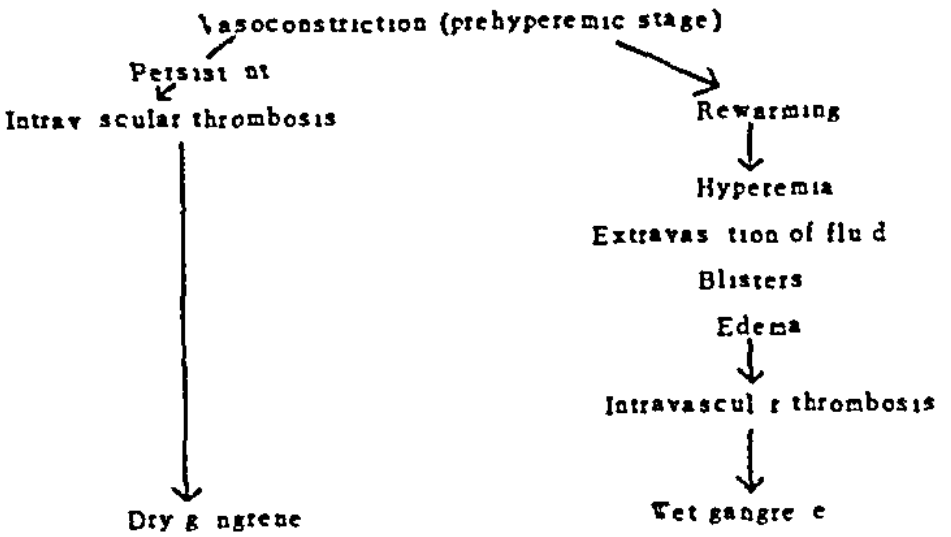


Figure 1 Schema of suggested course of events in the development of d y or u et gangrene in frostbite

It has been reported that pathologic specimens of gangrenous tissue removed weeks or months after exposure showed thrombi in all vessels *(8)* Fourth degree frostbite is always accompanied by the development of gangrene, either wet or dry It would seem that if thrombosis of the vessels occurred after rewarming, the subsequent ischemic tissues would develop a wet gangrene This type of tissue necrosis would be based on the extravasation of fluid, edema and blistering which would occur following rewarming but prior to vascular obliteration by thrombosis On the other hand, if intravascular thrombi had been firmly established at the arteriolar capillary junctions before release of a persistent vasospasm, it would seem that the stage of reactive hyperemia, followed by extravasation of fluid and blistering, would not occur This sequence of events would seem to favor the production of a dry gangrene These speculations seem to be corrob orated by Davis et al *(5)*

Thrombotic obliteration of the superficial cutaneous vessels with concomitant patency of the deep vessels would probably result in the development of a superficial gangrene Whether this gangrene would be wet or dry would probably depend on the amount of pathologic capillary permeability of the deep vessels Thrombosis of both the superficial and deep tissue vessels would result in both superficial and deep gangrene The occurrence of thrombosis either following the initial persistent vasospasm or

(8) Or K D and F r D C Cold injuries in K r a dur ng winter of 1950-51 M d c 31 177 220 May 1952

following the period of rewarming seems to determine the type of gangrene that ensues (fig 1)

High altitude frostbite has been and is still of major concern to flying personnel In World War II it occupied a prominent place on the list of battle casualties in the Eighth Air Force *(9)* As military aircraft reach higher and higher ceilings in the stratosphere, the problem of high altitude frostbite increases

Ground-level frostbite usually affects the flat surfaces of the face and extremities but in high altitude frostbite only the extremities are usually affected *(5)* In a study conducted on 20 airmen (tail gunners turret gunners and waist gunners) afflicted with frostbite during World War II 15 had frostbite of the fingers alone in 19 the cheeks face or toes in addition to the fingers were involved and 1 had injury to the buttock *(5)*

The pathogenesis of high altitude frostbite differs from that of ground-level frostbite only in the extremes of temperature experienced and the duration of exposure Extremely low temperatures *(-40 to -52 C) are encountered by patients who suffer high* altitude frostbite Exposure to such low temperature causes an extreme degree of vasospasm both direct and reflex producing marked ischemia which results in severe anoxemia and tissue damage Under standard operating conditions, pressurized cabins and oxygen equipment maintain normal oxygen tensions At high altitudes the breathing of atmospheric air with a reduced oxygen tension due to poor oxygen discipline faulty oxygen equipment, or accident at altitude will further enhance anoxemia The combination of extreme cold at high altitudes and anoxemia may cause severe tissue damage in 1 or 2 minutes whereas in ground-level frostbite a much longer period of exposure is necessary before severe damage results

CONCLUSION

It is suggested that ground level frostbite and high altitude frostbite not be considered as separate entities The two terms should only be used to designate the level at which the injury is incurred The pathogenesis of ground level and high altitude frostbite appears to be the same The only differences between the two is the ambient temperature at which each occurs and the duration of exposure necessary for severe tissue damage

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(9) Trench foot Special article prepared the Office of the Surgeon General U S Army M Dept 74 46-48, Mar 1944

THE ARMY MEDICAL SERVICE[1]

SILAS B HAYS *Major General MC USA* [2]

IN executing its mission of "conserving fighting strength," the Army Medical Service works in three general areas (1) the selection and elimination of personnel, (2) the prevention of disease, and (3) the treatment of the sick and injured

Before proceeding to a discussion of these, I should like to mention some of the principal internal problems now confronting the Medical Service Most important is our continuing shortage of trained professional personnel, including physicians, dentists, nurses, and certain categories of specialists As you know, the threat of Public Law 779—the doctor dentist draft law—has enabled us to meet minimum requirements for the Medical and Dental Corps since shortly after the outbreak of hostilities in Korea If Congress should fail to renew this law beyond its 30 June 1953 expiration date, our shortage of physicians and dentists would become acute overnight.

Another of our more persistent headaches concerns training—both military and professional for our officer and enlisted personnel Despite the dislocations caused by the Korean conflict, we are continuing our military residency program and seeking to assure medical officers progressive professional development in the service This is by no means easy

A third major area of concern for the Medical Service is the creation of an adequate mobilization reserve of materiel After World War II we were obliged to liquidate enormous stocks of medical supplies and equipment, and only last year were we again authorized to begin building a balanced stockpile for use in full scale war We are slowly accumulating this reserve, but the situation could hardly inspire complacency

Medical research and development is our fourth main problem Our present program is about 1,000 times as large as that for 1938 This tremendous effort demands careful planning and coordination with other agencies We must constantly review our whole program to see that money is not being wasted

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(1) Condensation of paper presented at the Army War College Carlisle Barracks Pa on 15 December 1952

(2) Deputy Surgeon General U S Army

These are our principal problems I should like now to return to the 3 main areas of responsibility which make up the mission of the Army Medical Service

In the *first* area—the selection and elimination of personnel—our job has been to help maintain armed forces of 3,600 000 men without lowering physical or mental health standards for enlistment or induction Even now we are barely able to maintain our authorized strength with the help of regular monthly levies on Selective Service If Congress should determine that this country needs a larger military establishment we should have to begin drafting veterans or lower our physical standards or both

Classification and assignment although ultimately Adjutant General and command functions are becoming of increasing concern to the Medical Service We are being called on to formulate practical physical profiles to fit the myriad jobs in today s Army of specialists We have only begun this work but the need is urgent for objectively determined physical standards by which we can select the combat infantryman the cook the truck driver and the typist This relatively new role of advising and assisting in the classification and assignment of personnel is occupying our attention from Department of the Army level on down to platoon level In the Surgeon General s office we are actively engaged in formulating a set of standards for optimum assignment of all personnel We hope that these criteria, refined by experience may some day become a recognized part of Army doctrine We realize, however that this program is long range in nature and involves the continuing education of both line and medical officers

Our *second* main field of activity is preventive medicine and more recently preventive psychiatry Despite the successful conquest of many communicable diseases, many problems remain Hepatitis which caused us to lose 10 million man days between 1941 and 1945 is still exacting a heavy toll in both the Far East and Europe Research was hampered by the lack of a laboratory animal to which the disease could be transmitted but recent reports indicate that mice inoculated with materials from a fatal human case have developed a transmissible form of hepatitis

Like so many other aspects of our preventive medicine program the excellent record on diarrhea and the dysenteries in Korea is as much a tribute to line commanders and their troops as it is a testimonial to the Medical Service With almost universal water pollution, conditions in Korea are ideal for the propagation of these ailments Yet even in the chaotic first year of fighting the incidence of diarrhea and dysentery in Korea was less than half that for World War II in Italy or the Philippines

and less than one fourth that in the China Burma India Theater Our experience in treating these conditions with streptomycin, chloramphenicol, and terramycin is similarly encouraging

Preventive psychiatry is a relatively unexplored field It offers a fascinating challenge to line and medical officers alike We are now operating mental hygiene consultation services in 16 troop-training divisions in the United States, including all basic training centers and 2 replacement training centers Mental hygiene staffs are now an organic part of the division's medical section They consist of a team of psychiatrists clinical psychologists, psychiatric social workers (commissioned and enlisted), and clinical psychology technicians Begun in 1948 this program is being broadened to include all training centers in the States

Despite the lowering of mental health standards for induction or enlistment in 1948 separations for psychiatric causes have been low Men are now being separated for these conditions at a rate which is less than half of the corresponding rate for World War II Much of the credit for this achievement must go to the combat psychiatry teams now attached to division clearing stations in Korea These units practice both preventive and curative psychiatry and have been able to return up to 70 percent of all patients with combat exhaustion to duty within the division area since the beginning of the Korean conflict

The fatality rate among wounded reaching medical care has been reduced to the all time low of 2 4 percent. The proportion of men killed in action among all those hit in Korea has been about the same as in World War II These facts led the military services to consider the adoption of a form of body armor A special test team reported this fall that more than two thirds of all missiles striking vests used experimentally in Korea were stopped, resulting in up to a 70 percent reduction in serious chest and abdominal wounds In addition from 25 to 35 percent of chest and abdominal wounds sustained by soldiers wearing the armor during the test period were reduced in severity

Another phase of our preventive medicine program is the veterinary food inspection service Veterinary inspection detachments examined over 4 billion pounds of meat and other food of animal origin during the last fiscal year Of this total, more than 127 million pounds were rejected for failing to meet health standards set for issue and consumption Besides the contribution of this work to safeguarding the health of military personnel, it also saved the Government in the last fiscal year over 13 million dollars, which would otherwise have been spent on food products unfit for troop consumption

Our *third* major field of responsibility is the treatment of the wounded and the diseased In military medicine, treatment means evacuation hospitalization, and rehabilitation Perhaps the most important difference between military and civilian medicine is the mass evacuation of casualties The Surgeon General suggested in his talk here last year that we might amend the traditional Medical Field Service School motto to read To conserve fighting strength *where it is needed* " This epitomizes our conviction that treatment should be conducted as far forward as possible to minimize the ebbing away of troop strength through medical channels This emphasis on the earliest possible treatment with the least possible evacuation rearward dominates our thinking on every problem of battlefield medicine, including combat exhaustion dental care battle wounds and optical repair and maintenance

To augment close in medical support for combat troops we have substituted the regimental medical company for the old regimental medical detachment of World War II This change almost triples the organic medical support available to a regiment in combat and has meant the assignment of one medical aidman to every rifle platoon Division medical service has been similarly bolstered by the addition of (1) 18 dentists, capable of handling 95 percent of the division dental workload and (2) a neuropsychiatric team in the clearing station complement Creation of the 60-bed mobile army surgical hospital (MASH), which can be readily augmented in case of need, has brought definitive surgery to the division area Skilled neurosurgeons anesthetists, and nurses now serve in these units within sound of artillery fire

Augmented forward area medical service has enabled us to return from 35 to 40 percent of all battle casualties to duty with their units without evacuating them beyond the division clearing station The MASH has helped reduce the death rate cut disability and shortened subsequent hospitalization for severely injured patients who require definitive surgery before further evacuation.

It is important that it be decided early which patients should be evacuated to the zone of the interior and which should be retained in the theater Any decision of this sort must be based on the theater s evacuation policy An evacuation policy is simply the maximum number of days a casualty may be retained at any echelon (battalion aid station, MASH or communications zone general hospital) It is essential that patients who will be hospitalized for a greater number of days be evacuated promptly This decision must be based on sound medical judgment For example assume an evacuation policy of 30 days for a hospital in Taegu Korea A patient arrives at the hospital with a gunshot

wound of the arm He is immediately evaluated and if it is determined that 45 days will be required before he will be ready for duty, he is transferred to the rear promptly, not after he has spent 30 days in the Taegu hospital If, on the other hand, it is determined on arrival that he will be ready for duty in less than 30 days, he is retained at Taegu for complete treatment

Considerations of logistics, the type of operations being conducted, intensity of combat, and the adequacy of medical facilities enter into the determination of an evacuation policy Different echelons in an overseas theater have different evacuation policies Patients may be retained in the division area only a few days They are frequently held as long as 30 days in rear area evacuation hospitals If they require longer hospitalization, they are usually removed to fixed bed station and general hospitals in the communications zone During the present hostilities we have adopted a 120 day evacuation policy for the Far East Command as a whole Most patients whose prognosis indicates longer hospitalization are transferred by airlift to the States

In any event, the evacuation policy must be flexible at every level A heavy influx of casualties, interruption of the arrival of replacements, supply stoppages, and many other variables may force the theater commander and his surgeon to revise their evacuation policies upward or downward

An evacuation policy is only as effective as the medical units which put it into effect They include the battalion aid station, forwardmost unit of the regimental medical service, where all patients requiring anything more than the services of an aidman are treated From the aid station, casualties may be returned to duty or sent on back to the regimental collecting station Critically wounded men may be flown by helicopter directly to a MASH In the division clearing station it is decided whether to send a casualty beyond the division area or to retain him in the combat zone

For those men who do need further hospitalization, the next step is a 400-bed semimobile evacuation hospital We call these units semimobile because they can move their equipment and tentage by shuttle, but require the assistance of a truck company if the entire hospital pulls up stakes at one time Supplementing these units are the more fixed 750-bed evacuation hospitals, usually allocated on the basis of 3 to a typical field army Both kinds of evacuation hospital provide definitive surgical and professional nursing care

An important adjunct to the evacuation hospital is the convalescent center Since World War II, we have reorganized this unit and 3 such centers, each with a 1,500-patient capacity, will

operate behind a typical field army Each convalescent center includes a 300-bed hospital and facilities for the rehabilitation of soldiers prior to their return to full duty

Station and general hospitals provide the most definitive medical care available in a theater of operations They are also the last port of call for patients who are to be evacuated to the zone of the interior The location of these facilities is usually dictated more by logistic necessity than by Medical Service doctrine

The terminal point in the chain of evacuation is the large named Army hospital in this country, providing definitive care for all types of patients In addition, we have established 15 specialized treatment centers by augmenting the medical staffs of selected station hospitals throughout the country with skilled surgical and other specialist personnel

Evacuation implies transportation Providing a flexible means of transporting casualties under the most adverse weather and terrain conditions in a combat zone is necessary if patients are to be properly treated All means of evacuation are being used in Korea They include simple man carry litters jeep ambulances regular ¼ ton ambulances, helicopters hospital trains road rail ambulances hospital ships, and transport planes of many sizes and ranges

Each of these means of evacuation has its place in medical service operations Each is indispensable in one or more situations and each must be provided in any realistic, flexible plan for enabling casualties to reach a treatment facility No one means of evacuation can wholly supplant another They supplement one another and dovetail into a coherent scheme of evacuation Ideally each conveyance should be exclusively for medical use Practically logistic economy requires us to share cargo space in planes with the supply services The classic pattern is to return patients in aircraft which have brought needed personnel and supplies forward.

The Medical Service has recently received approval on the Table of Organization and Equipment for a helicopter ambulance unit to function as an integral part of our field organization in a theater of operations These units will include five 2 rotor utility helicopters capable of carrying 3 litter patients or 4 ambulatory patients, a medical attendant, and a pilot They will be flown by Medical Service Corps lieutenants In their enthusiasm for helicopters and light aircraft I fear that some of their proponents tend to forget their limitations Besides carrying a small pay load helicopters require extensive maintenance, a suitable landing place and good flying weather Their use might have to be drastically restricted against an enemy with much

tactical airpower In such a situation, we should probably have to rely on conventional ambulances and hospital trains We are now designing an overseas ambulance train that can be adjusted to any gage track Despite their drawbacks, helicopters possess the unequaled advantage of getting casualties back to mobile surgical or evacuation hospitals with the least possible loss of time, and we know from experience that early operation in the combat area saves lives and minimizes disability Lives are saved at or near the front, not back in our well appointed stateside hospitals

No discussion of evacuation would be complete without mentioning the need for close control of the flow of patient traffic by the senior medical officer in a theater Sudden changes in the tactical situation may require forward hospitals to empty their beds and send a large number of patients to the rear without advance warning The theater surgeon must plan for such a contingency by having an adequate margin of available bed space in rear area treatment facilities Individual hospitals in the rear, some of them specialized, must be able to regulate their patient intake and outgo if they are to function effectively

Continual integrated planning should extend on back to station and general hospitals in the communications zone Here in the United States, we have established the Armed Services Medical Regulating Office to channel returning patients to the proper hospitals

The best planning and finest mechanical means of evacuation are useless if competent professional personnel are not available to care for our patients In the final analysis, the true worth of our Medical Service is directly dependent on the professional competence of our physicians, dentists, nurses, and other personnel

To give you an idea of what the Medical Service is accomplishing, I should like to cite a few comparative figures for Korean and past wars The cumulative death rate among wounded who reach medical treatment facilities in Korea is 2 4 percent, as against 4 5 in World War II and 8 1 in World War I Perhaps an even more striking index of our progress is the fact that 87 3 percent of those wounded in action in Korea are returned to full duty, compared with 77 1 percent in World War II Almost a third of those returned to duty never leave Korea, about 38 percent return to their units from Japan, and the rest are restored to full effectiveness in the States Only 4 1 percent of those wounded in Korea have been discharged because of disability Anyone who knows even a little of modern rehabilitation realizes how meaningless that word "disability" has become in recent years

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A HOSPITAL TUMOR REGISTRY

BONITA GODWIN B. A. (1)

A TUMOR registry is a set of records, dealing with malignant or potentially malignant lesions, compiled to insure a thorough follow up on each patient and to make available suitable records for physicians interested in research. A good tumor registry is adequately cross indexed and contains complete, easily accessible information regarding the history, diagnosis, treatment, follow up, and evaluation of therapy on all patients entered therein. In the past few years an increasing number of hospitals, both military and civilian, have established a tumor registry as an adjunct to their tumor board or tumor clinic. In order to promote adequate, uniform records, certain minimum standards which must be maintained by an approved cancer clinic have been outlined (2).

In September 1949 a tumor registry was established at this hospital to support the work of the tumor board which had been functioning for several years. The needs of the hospital were surveyed and other registries were studied in an effort to set up a system of records which would contain all essential information, but which, at the same time, would not be cumbersome or cause duplication of work by the physicians or the clerical workers. This registry occupies only 80 square feet of floor space, has, so far, been staffed by one secretary, and is located in the laboratory because proximity to the pathologic records is desirable. This has proved to be very satisfactory because cases are accessioned in the registry according to the pathologic diagnosis. When no pathologic diagnosis is available, the case is labeled "clinical" so that it may be dealt with accordingly by those who study it. Routinely, all current pathologic reports are screened by the registry secretary and used as a check list to assure the registration of all appropriate cases.

All patients with malignant tumors, other lesions which the physicians desire to follow, and rectal polyps are entered in the tumor registry. Benign tumors which are known to have no significant malignant potentialities are excluded because of the nature of the registry and because follow up letters written to a patient with a benign tumor might cause him to become unduly apprehensive.

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(1) Secretary, Tumor Registry, Walter Reed Army Hospital, Washington, D. C.
(2) Minimum standard for cancer clinics. Bull. Am. Coll. Surgeons, Dec. 1951, p. 397.

In accordance with the standards of the American College of Surgeons the tumor board at this hospital is composed of the chiefs of the dental laboratory medical radiologic and surgical services The chief of the laboratory service serves as president of the tumor board and the permanent board members with the exception of the chief of the dental service rotate as chairman at the meetings The secretary of the tumor registry acts also as secretary to the tumor board Regular

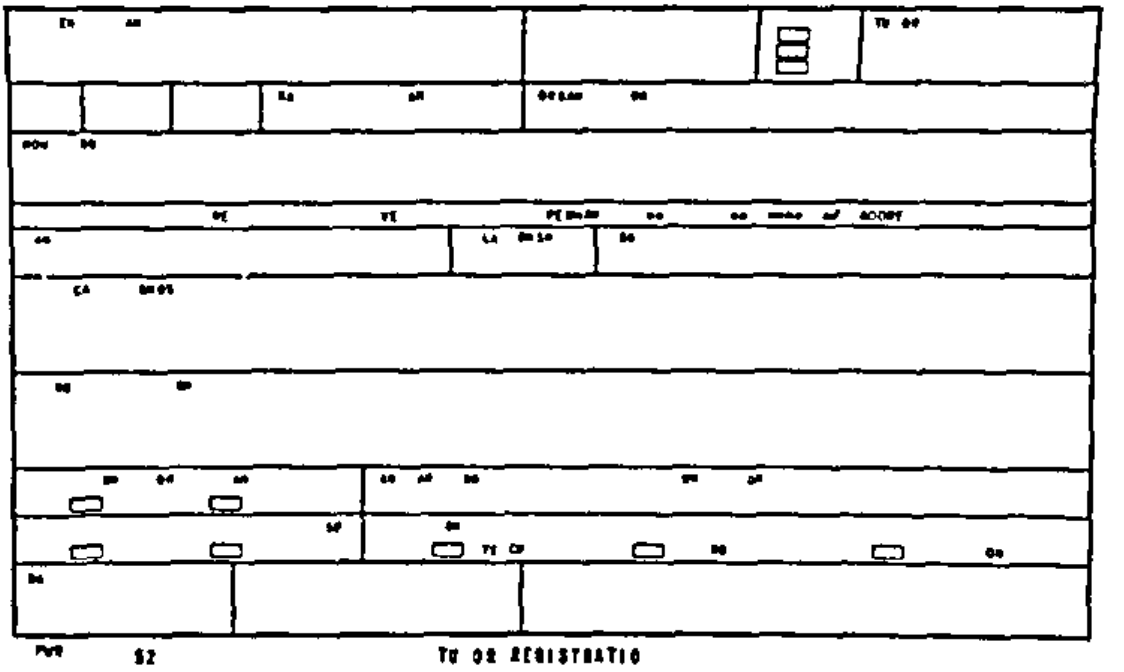


Figure 1 Tumor registration card

tumor board conferences are held weekly and special meetings are called if a patient s condition demands an immediate decision Attendance of all medical officers at the conference is expected and free discussion of cases is encouraged Only members of the tumor board and the chief of the section presenting the patient may vote on the disposition of a patient and a majority rules Abstracted proceedings of the conferences are compiled in the form of minutes The recommendations of the board are prepared in duplicate one copy becomes a part of the patient s permanent record and one is retained in the registry A patient may be presented to the tumor board as often as his changing condition indicates

To register a case the physician caring for the patient submits a completed tumor registration card (fig 1) to the secretary of the registry Most of the information on this card can be obtained from the patient s chart but it is often necessary to contact the patient and ask for the name and address of some rela

tive or friend with a permanent address who would, at all times, know the whereabouts of the patient. This is especially important in attempting to follow service personnel whose addresses are usually relatively temporary

In this hospital, a case entered in the registry may be placed in one of three categories "Teaching," "Board Review," or "Record Only." It is the responsibility of the ward officer, working with his chief of service, to classify his cases properly If a patient has a rare type of tumor, has followed an unusual course, or would be particularly instructive, his card is entered in the "teaching" section and he is thoroughly worked up for presentation by the ward officer at the weekly tumor board conference If he presents a diagnostic problem or there is a question as to the treatment of choice, he is presented to the conference as a "Board Review" case for discussion and a decision as to the proper therapy If he falls into neither of these categories, he is classed as a "Record Only" case, and the ward officer gives the tumor board a concise abstract of the findings in order that they may approve the treatment or make recommendations for further study or therapy Other than in the mode of presentation and discussion, there is no difference in the treatment or in the recording of these classes of cases All are followed in the same manner

On receipt of the registration card, the secretary of the registry, after checking the files to ascertain the pathologic diagnosis, accessions the case and assigns to each patient a tumor registry number Patients are listed chronologically the first 2 digits in the accession number indicate the year of registration, e g, 51 613 Regardless of how often a patient is presented, he retains his original accession number

A patient's individual folder, filed according to tumor registry number, is set up to contain all information regarding the patient, including his registration card, abstract of presentation at tumor board conference recommendation of the tumor board, American College of Surgeons Tumor Record Form, a summary of each hospitalization, irradiation data, correspondence with the patient and with physicians and other hospitals concerning the patient, autopsy protocol, and any other material pertinent to the case

The master card (fig 2) is the key to the tumor registry and is filed alphabetically according to the patient's name There are facilities for flagging the card with varicolored celluloid tabs so that the secretary of the registry can determine at a glance what forms are due on each patient and the status of the follow up

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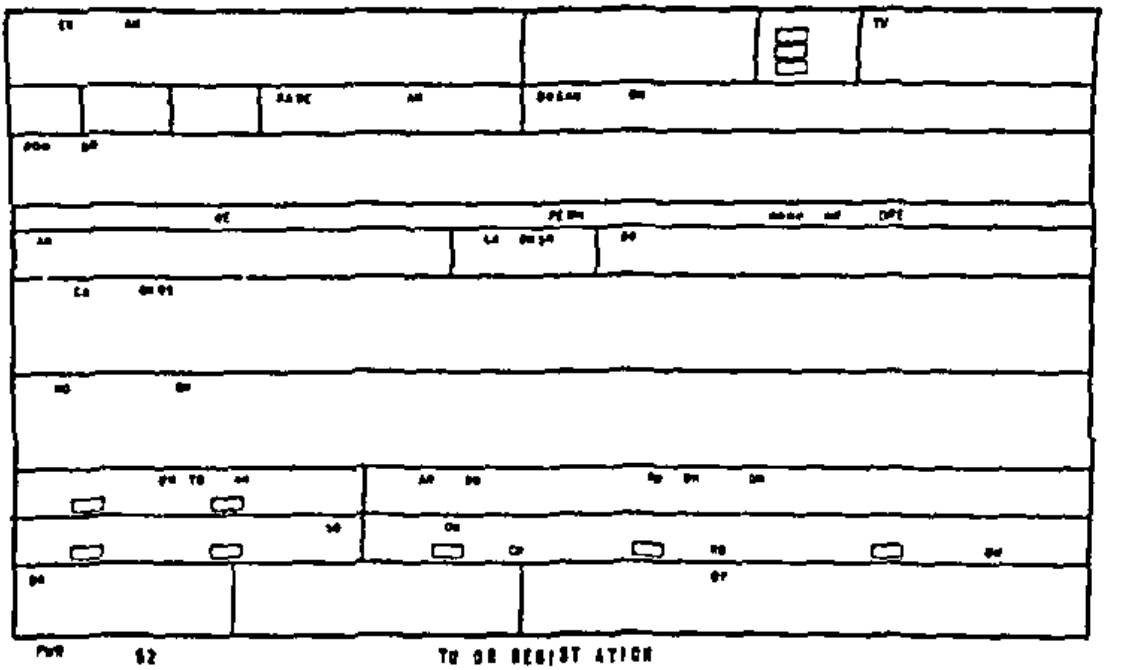


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The time interval between follow up contacts varies according to the type of case and the stipulation of the physician Though letters of inquiry must, to a degree, be individualized, it is often possible to use form letters A franked envelope, addressed to the registry, is enclosed with the inquiry A typical letter asks the patient for his own evaluation of his condition, the date of his last visit to a physician, and the name and full mailing address of that physician Questions may be as general or specific as indicated by the particular case, and when a physician desires to conduct a special study, the registry assists by distributing special questionnaires to the selected group

The interest of the hospital staff, as reflected in the work of the tumor registry, is usually appreciated and patient response is generally enthusiastic The registry, in maintaining contact with the patient, makes him more alert and co operative, often increasing his chance for survival because, knowing that his condition is of sufficient significance to warrant the continued attention of the physician, the patient is stimulated to watch for symptoms and to seek medical consultation more promptly and freely than he might otherwise

It is not uncommon to encounter a patient who has been entered in 2 or more registries In this event, we believe that the follow up contact should be maintained by the hospital where the pathologic diagnosis of malignancy was established originally Other registries in turn can secure follow up in

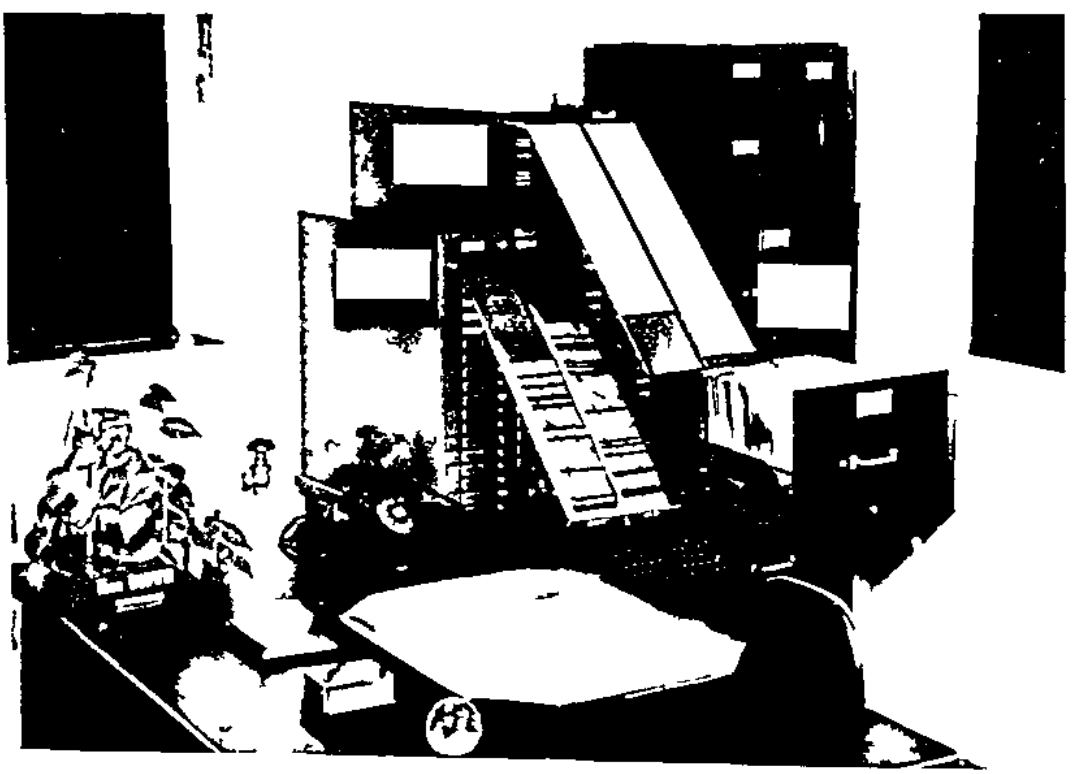


Figure 3 Walter Reed Army Hospital tumor registry

formation from that hospital rather than from the patient If a patient receives letters from multiple registries he may become surfeited with follow up inquiries and fail to co-operate or he may become overly alarmed about his condition and develop hypochondriasis

Uniformity in tumor registry records is desirable If the needs could be surveyed and the forms standardized it would be possible for a patient s records to be transferred from one hospital to another without the confusion which often exists now and the danger of error would be minimized I urthermore if tumor registry procedures and forms were uniform it would enable the physician or the medical secretary transferred from one installation to another to work effectively with tumor records eliminating the period of orientation which is necessary now at each new station This standardization does not appear to be impracticable because the fundamental needs of tumor registries are the same and the information which is recorded regarding tumor cases is almost universally similar

Work is now underway to adapt the registry at this hospital to punch cards This is being done carefully and deliberately and with the realization that the chief problem lies in including all information which will become necessary as cases accumulate follow up lengthens and cancer therapy changes with increasing knowledge Information sought will necessarily vary somewhat according to the site and type of lesion Here especially would uniformity in tumor registry forms be valuable for larger series could then be screened with a minimum of time effort and expense whereas at present only the cases in an individual hospital are readily available for reports

A collection of reprints pamphlets abstracts and miscellaneous literature pertaining to tumors is being assembled in conjunction with this tumor registry This is small and simply organized but it is proving of value to the physicians and they in turn assist in channeling material into this reprint library

CONCLUSIONS

The value of a tumor registry is in direct proportion to the care exercised by the physician in submitting records Time spent in furnishing adequate reports to the registry is an investment which pays increasing dividends to the patient and to the physician as the number of cases multiplies and the follow up period lengthens Osler s description of the functions of a good hospital might be equally applicable to a good tumor registry as it aids in "the care of the sick the education of the physician and the advancement of science "

THE ROLE OF THIAMINE HYDROCHLORIDE IN DENTISTRY

II Therapeutic Use of Thiamine in Dental Disorders *(1)*

JAMES L E BOCK *Lieutenant Colonel USAF (DC) (2)*

DENTAL caries Various theories have been advanced for the cause of dental caries One cause that has been suggested is malnutrition Thiamine deficiency has been singled out as one factor in malnutrition which may affect dental caries by producing an acid saliva Hoarman *(113)* suggested that in the absence of thiamine, the normal breakdown of pyruvate formed during carbohydrate fermentation, does not occur and acid, which results in decalcification at the gingival margins, is liberated On the other hand, Fancher et al *(114)*, from extensive tests, concluded that the vitamin stimulated acid formation in saliva and that only vitamin K inhibited acid formation In one study *(115)* on 41 selected patients with evidence of pellagra, beriberi, and riboflavin deficiency, it was observed that a low incidence of caries and correspondingly low numbers of oral lactobacilli were present Caries was observed to be inhibited in another group of thiamine deficient patients *(60)* Laboratory experiments *(116)* have shown that lactobacilli fail to grow in media without vitamin B complex and that thiamine is essential for some strains of lactobacilli

Because thiamine and the thyroid gland are such important factors in normal metabolism and growth an interrelationship between the two which may play a significant part in the structural development of teeth may exist. Rhesus monkeys on which thyroidectomies were performed showed a marked retardation of dentin apposition and later an acceleration of dentin

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(1) Part I appeared in the U S Armed Forces Medical Journal vol 4 pp 81-97 Jan 1953

(2) Brooke Army Medical Center Fort Sam Houston Texas

(113) Hoarman C. D Department of Physiology Dental caries Dental J Australia 11 692 Nov 1939

(114) Fancher O E Caldwell J C. and Fosdick L S. Effect of vitamins on experimental caries Journal Dent Research 23 23 29 Feb 1944

(115) Knutson A H Mann, A W and Spies T D Relationship of dental caries to deficiency of vitamin B group J Dent Research 21 259-262 June 194

(116) Kodicek E. and Fish B J Vitamin requirement of oral lactobacilli J Dent Research 29 760 773 Dec 1950

apposition in those given thyroxin *(117)* Eruption of teeth was also observed to be accelerated following the injection of thyroxin in rats *(118)* The calcification of teeth depends on the normal functioning of the thyroid, and this is influenced to a large extent by the presence of thiamine *(91)* Peters and Rossiter *(49)* have demonstrated that an increase of thyroid or thyroxin increases the thiamine requirements Although a high incidence of caries has been observed in both hypothroidism and hyperthyroidism *(119)* there is inconclusive evidence that thiamine plays a role in the prevention of dental caries It is generally believed that good nutrition is not as important to the teeth as it is to other organs

Tic douloureux (trigeminal neuralgia) is a specific type of facial neuralgia affecting the peripheral branches of the trigeminal nerve and is characterized by sudden onset severe painful spasms complete freedom from pain between attacks and a trigger zone which when touched will usually precipitate an attack The usual treatment consists of alcohol injection, nerve avulsion or intracranial section of the posterior sensory root. Alcohol injections are painful and afford only temporary relief Although surgical procedures give permanent relief, a permanent anesthesia is also produced which in some patients is more disturbing than the original pain

Borsook et al *(67)* gave 58 patients with major trigeminal neuralgia 10 mg of thiamine hydrochloride intravenously daily 37 showed marked improvement 15 were moderately improved 3 showed slight improvement and 3 showed no improvement. Twenty five percent of the patients failed to respond to treatment until liver extract was added The time required for improvement varied from 1 to 6 months after initiating treatment. A patient with tic douloureux successfully treated with massive doses of thiamine is reported below

Case 1 A 25 year old nurse reported to the dental clinic on 5 March 1951 complaining of intense pain in the right side of her mandible She believed that her pain was due to an unerupted mandibular third molar Roentgenograms revealed a partially erupted third molar No pathologic change and no evidence that pressure was being exerted on the adjacent teeth was discernible Clinical examination failed to reveal any inflammatory process in the area. Six months previously the patient had experienced a severe spasm of pain in the right side of her face which lasted

(117) Z ki D E nd Appl ba m E J Eff ts of thyr d my nd hyr d mulat grow ng pe mane d t of be us m nkey J De R ar h 20 21 27 F b 1941

(118) K ll gg M. nd Eddy W H Ha tam B_1 l pr tion of De Cosm 74 334 Apr 1932

(119) Se pp 307 309 *I* foot fer *(64)*

for about 2 minutes Other such attacks were experienced with increasing frequency over a 4 month period She was unable to localize the pain because it seemed to affect her eye, upper jaw, and lower jaw Two months prior to admission, spasmodic attacks of pain were confined to her mandible and instead of periods of complete relief, a constant dull ache in the molar region of her mandible was experienced and persisted without changing in severity She noted that spasms were frequently induced by brushing her teeth During the clinical examination with mouth mirror and explorer, a paroxysm was observed when her right mandibular cuspid was touched

Pain was relieved by an inferior dental nerve injection with 2 percent procaine, but returned in 2 hours with the same degree of pain that was experienced prior to treatment. A diagnosis of atypical trigeminal neuralgia was considered in this case because of the persistent pain existing between acute attacks, but because of the lancinating, painful attacks and the characteristic trigger zone, a final diagnosis of tic douloureux was made One hundred milligrams of thiamine hydrochloride was injected intramuscularly daily for 14 days Slight improvement was noted the third day On the seventh day, the dull ache completely disappeared and the paroxysmal attacks of pain were less frequent On the tenth day, the patient experienced a slight twinge of pain and thereafter was completely relieved The pain had not recurred 18 months later

It is recommended that thiamine hydrochloride be used therapeutically for tic douloureux in all patients before resorting to radical surgical procedures Even moderate improvement would be better than the permanent anesthesia produced by operation

Bell s palsy is a paralysis of the peripheral portion of the facial nerve It may result from trauma, pressure from neoplasms, or infections but more commonly is seen as a result of exposure to cold and drafts In mild cases, spontaneous recovery is usual in from 1 to 3 months In more severe cases, especially in those caused from injury, nerve repairs have been accomplished *(120)* Lerner *(69)* reported 7 patients with peripheral facial paralysis treated with parenteral injections of thiamine In 5, the disease was of short duration and in 2 it had existed for 9 and 14 years, respectively Five thousand units (15 mg) of the vitamin were given daily in most cases, continuing that dose until the lagophthalmos disappeared and then giving 1,000 units daily until recovery was complete Partial recovery was noted in from 3 to 5 days with complete cures in from 6 to 18 days The two patients with chronic disease were markedly improved but not completely cured

(120) Thomas K H Oral Surgery C V Mosby C St Louis Mo 1948 v I 2 pp 1042 1073

Neuralgia of the sphenopalatine ganglion of the trigeminal nerve (Sluder s syndrome) is usually treated with cocainization or alcohol injections Borsook et al. *(67)* reported 4 patients with this syndrome who were given 10 mg of thiamine hydrochloride intravenously Two of them were markedly and 2 moderately improved

Fractures The treatment of simple fractures of the maxilla and mandible consists primarily of reduction, immobilization and fixation but if the fractures are severe or complicated with other injuries the general condition of the patient is more important than the fixation of the fracture Shock hemorrhage infection and pain should be controlled before any attempt is made to treat the fracture

Shock is an acute failure of the peripheral circulation After a critical point has been passed progressive anoxia leads to metabolic changes and to damage of such organs as the brain heart and adrenals *(81)* The respiration of liver tissue is severely depressed in shock following hemorrhage Govier and Greer *(85)* observed that the survival time of thiamine treated dogs suffering from shock induced by hemorrhage was from 2 to 4 times that of untreated dogs In shock produced by hemorrhage in dogs there is a fall in blood pressure an increase in blood sugar and an increase in lactic acid and keto acids in the blood *(80)* After thiamine administration, there is a fall in these elevated values a rise in blood pressure, and an increase in survival time Treatment of shock consists in part of the replacement of the glycogen reserve in the liver and muscles which require an increased amount of thiamine for proper metabolism Thus there appears to be a definite indication for the administration of thiamine as part of the treatment of shock

There is a loss of thiamine in severely damaged tissues *(82)* and in infected tissues *(101)* There is a decrease in the circulating antibodies in thiamine-deficient rats *(122)* It is generally believed that a deficiency of thiamine lowers the resistance to disease Elsom *(123)* noted that patients who preoperatively showed few or no signs of a vitamin deficiency often develop a frank deficiency of thiamine following operation. It would therefore, appear that thiamine administration would be beneficial in preventing or combating infection in patients with fractures

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(121) J lldf N H db k f tr c nd t d mal t o J A M A 122 299 306 May 29 1943

(122) Ca B B nd A lrod A E C l t g bod s tam d f y ta s thiam d b d f nc P Soc E pe B l & M d 67 416-417 Ap 1948

(123) El m K. O P l pe t f tam B d f y M Cl N h Am 21 1229-1244 J ly 1937

Although pain is not usually present after a fracture has been reduced and immobilized, neurologic symptoms are sometimes manifested as a result of nerve injury and may take the form of a paresthesia, facial paralysis, or neuralgia I have observed 7 patients with fractures in whom neurologic signs appeared after the fractures had been fixed. They were given 100 mg of thiamine hydrochloride daily until the neurologic symptoms disappeared. Five patients with neuralgia, 2 of whom had hypersensitive teeth, were relieved within 20 minutes after the first injection Pain returned in 2 patients after 24 hours but with less severity and after a second injection the pain did not recur A paresthesia of the inferior dental nerve in 1 patient with fracture responded to treatment after 3 days Another patient with fracture, exhibiting a paralysis of the buccal and mandibular branches of the facial nerve and a paresthesia of the inferior dental nerve, required 10 days of thiamine therapy before the neurologic symptoms disappeared

Because of its diversified physiologic action, thiamine seems to be an important therapeutic and preventive agent in patients with fractures which may be, or may become complicated by shock infection or neurologic disturbances This has been demonstrated clinically and experimentally

Anesthesia and anoxia Ether anesthesia produces a moderate increase in keto-acids blood sugar, and lactic acid *(80)*, and epinephrine stimulates glycogenolysis in the liver *(81)* thus increasing the thiamine requirements Thiamine is lost in hemorrhage *(36)* and hemorrhage enhances the action of anesthetics probably as a result of the reduction in the effectiveness of circulatory readjustments together with an already impaired delivery of oxygen to the cells As a result, cellular respiration and reserve power are reduced and the narcotic level of depression is reached more easily *(124)* From the standpoint of their effect on the patient s carbohydrate metabolism (and of the diabetic in particular) the order of preference of anesthetic methods according to Blalock *(81)* is as follows (1) local or block procaine, (2) spinal, (3) cyclopropane and oxygen, (4) ethylene and oxygen, (5) nitrous oxide and oxygen, (6) pentothal by vein and (7) ether A patient suffering from thiamine deficiency would seem to be more susceptible to anesthesia and more prone to develop anoxia at an earlier stage than a normal patient Although the literature does not reveal the clinical application of thiamine in anesthesia, it seems logical that it could be of some value in general anesthesia in raising the cellular respiration of the tissues, particularly those of the brain and thereby reduce the possibility of anoxia.

(124) Wood D R and Jacobson N T Effect of hemorrhage on anesthetic dosage J Pharmacol & Exper Therap 79 259-265 Nov 1943

Neuralgia of the sphenopalatine ganglion of the trigeminal nerve (Sluder s syndrome) is usually treated with cocainization or alcohol injections Borsook et al. *(67)* reported 4 patients with this syndrome who were given 10 mg of thiamine hydrochloride intravenously Two of them were markedly and 2 moderately improved

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(122) Ca B B nd A lrod A E C l t g t bod tam n d f y ta thiam d b t d f enc P Soc E pe B l & M d 67 416 417 Ap 1948

(123) El m K O P t l pe t f tam B d f y M Cl N h Am 21 1229-1244 J ly 1937

herpetic lesions Her previous inadequate diet and the disappearance and nonrecurrence of the herpetic lesions following thiamine therapy suggests that her stomatitis was due to a thiamine deficiency

Hypersensitive teeth Patients deficient in thiamine show a marked sensitivity of the oral tissues *(60)* and extreme sensitiveness of the teeth to instrumentation and an abnormal thermal response *(129)* Such conditions have been greatly improved with the use of thiamine Since 1943 I have used thiamine therapeutically in a large number of patients presenting various pain syndromes In a substantial number of patients with hypersensitive teeth, the use of thiamine has been observed markedly to reduce sensitivity and in a few has completely relieved the condition The sensitivity of teeth in most of these patients was due to some operative dental procedure or occurred in conjunction with other dental disorders such as trauma following operation, deep scaling, overhanging fillings, ill fitting partial dentures, fractures, traumatic occlusion, deep fillings, Vincent's infection, and gingivitis associated with pregnancy All of these patients were treated with 100 mg of thiamine hydrochloride injected intramuscularly daily until symptoms were relieved In most patients one injection was sufficient rarely a second injection was required Beneficial results were obtained in from 20 to 30 minutes after injection

A series of 18 patients with hypersensitive teeth were treated with 10 mg of thiamine hydrochloride by intraoral injection In 9, the condition was due to deep scaling or gingivectomy and of these, marked improvement was observed in 3 and complete relief in 6 In 7 patients, hypersensitive teeth followed oral surgical procedures and complete relief resulted from the thiamine injection Two patients with acute pericementitis caused by traumatic occlusion were treated by occlusal adjustments, but pain and sensitivity were not relieved until thiamine had been administered Beneficial effects were noted in about 10 minutes after the thiamine injections

Two patients with acute pericementitis following root canal therapy were relieved by the intramuscular injection of 100 mg of thiamine in 15 and 30 minutes respectively Intraoral injections were not used because of the presence of acute inflammation. Hypersensitive teeth associated with a peripheral neuritis of the infraorbital nerve of 4 days duration in a woman who was 6 months pregnant was observed Complete relief was obtained in 10 minutes after 10 mg of thiamine was injected intraorally

(129) Sinclair J A Vitamin A and B deficiency—etiological factor in acute subacute and chronic Vincent's infection and other dental conditions J Am Dent A 26 1611 1618 Oct 1939

The patient was given multivitamins daily by mouth for the remainder of her pregnancy Pain and sensitivity did not recur

Whether a general thiamine deficiency or a local deficiency due to injury, trauma, or infection existed in these patients is a matter of conjecture because no blood thiamine determinations were made It may be surmised however, that they had a sub clinical deficiency and that the various operative procedures were only the exciting factors in further lowering the thiamine concentration which resulted in pain and hypersensitivity The peripheral neuritis and dental sensitivity in the pregnant woman is believed to have been due to a deficiency brought about by the increased thiamine requirements of pregnancy Beneficial results have not been obtained in hypersensitive teeth caused by erosion deep caries or exposed pulp

Postoperative pain Clinical observations were made on the results obtained in 30 patients with postoperative pain when different concentrations of thiamine were parenterally injected in various sites In 20 intraoral infiltration of 10 mg of thiamine gave complete relief of pain in an average of 8 minutes and 42 seconds Pain did not recur in any of these In 3 intraoral infiltration of 100 mg of thiamine gave relief of pain in 26 30 and 30 minutes respectively Pain reappeared in 24 hours in 1 patient but with less severity and was completely relieved by a second injection In 2 intramuscular injection of 100 mg of the vitamin in the deltoid muscle gave relief in 18 and 25 minutes respectively In 3 injection of 100 mg of thiamine in the gluteal muscles gave relief in 15 18 and 30 minutes respectively Pain reappeared in 24 hours in 2 of these and a second injection was required Two patients were given 10 mg of thiamine intramuscularly in the arm with no apparent effect on the pain. These same 2 patients responded promptly to treatment when 10 mg of the drug was injected intraorally

A period of exacerbation of pain lasting from 30 seconds to 8 minutes was observed following all intraoral injections This was more intense and of longer duration when 100 mg was given than when 10 mg was used The degree of increase in pain following the injection appeared to be in direct proportion to the degree of pain experienced prior to injection There was no exacerbation of pain when intramuscular injections of thiamine were given

The parenteral administration of thiamine usually gives rise to a moldy or yeasty taste in the tongue The circulation time of the vitamin determined by recording the elapsed time between the injection and the appearance of this taste is from 9 8 to 10 3 seconds when the drug is injected intravenously in the

arm *(130)* The circulation time following intramuscular injections varies from 30 seconds to 5 minutes, regardless of site When thiamine is infiltrated intraorally, the circulation time averaged 13 3 seconds The fact that thiamine is more rapidly absorbed following intraoral infiltration than following intramuscular injection accounts for the quicker beneficial results obtained when the intraoral route is used

The patients who received 10 mg of thiamine intramuscularly were unable to detect the characteristic taste When the same patients were given 10 mg intraorally, they were promptly able to identify the "thiamine taste" This seems to indicate that a much lower blood thiamine level results from intramuscular than from intraoral injection. For this reason, larger doses of thiamine are required for intramuscular injections to assure a therapeutic concentration

Paresthesia Impaired sensation of the trigeminal nerve is a rather common occurrence and may be due to traumatic injury, inflammation, pressure from tumors, edema, local anesthetic injections, fractures, or oral surgical procedures The degree and duration of paresthesia depends on the extent of injury and may last from a few days to years Two patients with paresthesia were treated with parenteral administration of thiamine

Case 2 A 24 year-old man noticed a peculiar, numbing sensation of the buccal mucosa on the left side on 10 February 1952 The area involved was in line with the occlusion of the teeth and about 1 cm from the corner of his mouth He felt as though there was a swelling or growth present The diagnoses considered included psychoneurosis, carcinophobia, leukoplakia, and local irritation from malocclusion Occlusal equilibration and local medications did not relieve the condition The paresthesia had existed for 7 weeks when the patient was seen in the oral surgery clinic on 1 April At this time, no lesion was discernible, the buccal mucosa was normal to inspection and palpation Ten milligrams of thiamine hydrochloride was infiltrated into the mucobuccal fold in the area of the paresthesia. Normal sensation was experienced in 6 minutes after injection A slight numbing sensation reappeared on the following day but disappeared after a few hours without further treatment and did not recur A final diagnosis of paresthesia of the peripheral ending of the buccinator branch of the trigeminal nerve was made

Case 3 A 72 year old edentulous man had a root tip removed from the body of the mandible on the left side on 4 April 1952

(130) Swenson R. E Par ..t t l vitamin B as gent for det mining rm-t -tongue circul t on t m Am Heart J 32 61 -616 N v 1946

The root tip was in close proximity to the mental foramen and the mental nerve was injured at the time of operation The patient was warned that a paresthesia would exist following operation On 13 May he returned to the clinic complaining of a constant, dull pain in the mandible associated with a numb, tingling sensation of his lip and chin which had been present since the operation Ten milligrams of thiamine was infiltrated into the mucobuccal fold in the region of his mental foramen The pain was increased for 30 seconds but complete relief was obtained in 5 minutes Partial feeling returned to his lip He was seen on the following day at which time normal sensation was present The pain and paresthesia did not recur

Dry sockets One of the most distressing complications that may occur following dental extractions is the dry socket. The symptoms generally set in on the second or third day after the extraction and last for from 10 to 40 days *(131)* Various drugs obtundents and dressings have been used with little success In spite of the drugs used pain is only temporarily relieved and the duration of the condition is not shortened to any great degree Dry sockets do not occur as often today as they have in the past probably because of improved asepsis and the use of antibiotics and better surgical technic In spite of all precautions that may be taken by the most skilled operators however, dry sockets occasionally occur

Fifty patients with dry socket were treated by the intramuscular injection of 100 mg of thiamine hydrochloride Relief of pain was obtained in all patients within from 15 to 30 minutes after injection No other treatment was instituted until the pain was relieved and then the socket was irrigated with normal saline solution and a dry dressing applied The dressings were changed daily until the socket was healed The healing process seemed to be accelerated with the use of thiamine The pain did not recur in 42 of the patients In 7 the pain recurred in 24 hours but with less severity and a second injection gave complete relief One patient required 3 injections before complete relief was obtained but after each injection the pain was relieved for 24 hours

Dry socket was more prevalent during the hot summer months than at any other time of the year Forty of the 50 cases studied occurred during June July, and August. The daily high temperature of the locale where these observations were made ranged from 102 to 118 F Because these patients were all military personnel and presumably consuming the same general diet it would appear that extreme climatic conditions may be a factor

(131) S pp 168 171 f f (120)

in the occurrence of dry sockets There is experimental evidence of heightened thiamine requirements in tropical heat *(57)*

One hundred milligrams of thiamine given intramuscularly will relieve the pain in dry sockets in an average of 20 minutes A study of 11 patients with dry socket was made in an attempt to determine whether similar results could be obtained by injecting smaller amounts of the drug intraorally in the immediate area of the dry socket Nine were injected intraorally with 10 mg and 2 with 100 mg When 10 mg was used, exacerbation of the pain lasting for from 30 seconds to 2 minutes was experienced immediately after injection Complete relief was obtained in about 11 minutes The 2 patients given 100 mg of thiamine intraorally experienced exacerbation of pain for 5 and 8 minutes, respectively, with complete relief occurring in 26 and 30 minutes The reason for the increased pain immediately after intraoral injection is not clearly understood It may be that concentrated amounts of thiamine have a momentary stimulating effect on nerves when injected into areas that have already been over stimulated Increasing the concentration of thiamine seems to increase the period of pain exacerbation and delays the therapeutic effect The pain did not recur in any of the patients The only other treatment given these patients was irrigation and the insertion of dry dressings The dressings were changed daily until the socket was healed—usually from 3 to 5 days Ten milligrams of thiamine seems to be sufficient if given intraorally and the results obtained are equal to those obtained with 100 mg given intramuscularly The advantages of intra oral injection are (1) the thiamine can be placed directly in the area of desired action, (2) smaller doses are effective, and (3) quicker relief The only disadvantage of intraoral injection is the period of increased pain that is experienced immediately after injection

Temporomandibular joint pain Two patients with temporo-mandibular joint pain of 6 and 12 months' duration respectively were treated with massive doses of thiamine hydrochloride Because of the long duration of pain, appreciable nerve damage had probably resulted and an early response to treatment was not expected

Case 4 A 28 year-old woman who complained of temporo-mandibular joint pain of 12 months duration was referred to the oral surgery clinic on 4 April 1952 The onset was associated with a difficult pregnancy and recurrent attacks of gallbladder disease for which a cholecystectomy had been performed Her symptoms on admission were the joint pain, burning sensation of the tongue, tinnitus, muscular tenderness and weakness backache anorexia, nervousness, dysmenorrhea, mental depres-

sion and general lassitude A roentgenogram revealed excessive mobility of the right mandibular condyle when her jaws were open She had had periodontal treatment occlusal equilibration, and had worn a bite raising appliance Her history and symptoms suggested a possible thiamine deficiency

Treatment consisted of the daily intramuscular injection of 100 mg of thiamine hydrochloride Ten injections were given and then the patient was given multivitamins by mouth The intramuscular injections were stopped because she was unable to continue the daily visits to the clinic Her general symptoms were markedly improved after 10 days of treatment She felt better physically, her appetite increased, her backache and muscular tenderness disappeared, housework was accomplished without excessive fatigue and a menstrual period was less painful than usual but the oral symptoms had not changed to any extent

It is possible that this type of pain will not be relieved by thiamine because of the continued irritation resulting from the hypermobility of the mandibular condyle against the articular eminence Thiamine has a stimulating effect on muscle *(58)* and retards muscular fatigue Because there was evidence that this patient was deficient in thiamine it was thought that this deficiency might have been a factor in causing the joint pain associated with muscular weakness and tenderness The drug was given not only to relieve the pain, but to stimulate and strengthen the muscles of mastication and thereby aid in reducing the hypermobility of the mandibular condyle The patient is still taking the vitamin by mouth but the prognosis is not as good as it would have been if parenteral administration could have been continued longer

Case 5 A 26 year old woman was referred to the oral surgery clinic because of temporomandibular joint pain She had had acute rheumatic fever in 1946 In September 1951 she developed diabetes mellitus which was controlled by 10 units of insulin daily In December she developed a right otitis media which was accompanied by pain in the preauricular region Consultation with an eye ear nose and throat specialist resulted in the removal of a tumor by the use of radium seeds following which the otitis media was cleared but the pain increased in severity and deafness tinnitus a clicking noise when the mandible was depressed and a pain behind the ear and in the temporal region (but most severe in the joint itself) developed The pain was described as a constant boring dull ache with exacerbations occurring several times daily The patient had had no relief since the onset Treatment had consisted of diathermy and the daily oral administration of vitamin B complex Roentgenographic examination revealed no abnormalities

A diagnosis of peripheral neuritis of the auriculotemporal and masseteric branches of the mandibular nerve and degenera tive changes of the auditory nerve as a result of otitis media and radium treatment was made In spite of the patient having had vitamin B complex by mouth without beneficial results, daily intramuscular injections of 100 mg of thiamine hydrochloride were started on 16 April 1952 On the fourth day of treatment the intense pain began to subside It became inter mittent on the fourteenth day and was completely relieved on the twenty second day The injections were continued for an additional week, at which time 30 injections had been given All neurologic symptoms were relieved completely with the exception of the deafness and this has been markedly improved

This case is another example of the beneficial effect that thiamine has on diseased and injured nerves when administered parenterally in adequate doses It also demonstrates the in effectiveness of oral administration Although therapeutic results have been obtained by the oral administration of thiamine, it has not proved to be as effective as parenteral administration

Trismus is tonic spasm or rigidity of the muscles of mastica tion which interferes with the normal opening of the mouth and usually is the result of injury, trauma, or inflammation involving the teeth and the surrounding soft tissues Dry sockets, peri coronitis of third molars, and fractures are the most common causes The usual treatment consists of the removal of the cause and the use of hot, moist applications to aid in muscular relaxation Response to this type of treatment is slow and the patient obtains little or no relief until acute tissue reactions have subsided Even then, trismus may persist to a certain degree, or a false ankylosis may result from the inflammatory changes in the muscles and soft tissues *(132)* Meanwhile, the patient is unable to masticate food and is extremely uncomfort able.

Thiamine is beneficial in retarding muscular fatigue and preventing muscular contractions when the associated nerve has been stimulated *(58, 133)* With the foregoing facts in mind, the effect of thiamine on a series of 9 patients with trismus was observed In 8, the trismus followed surgical removal of teeth and in 1 it was associated with pericoronitis of a mandibu lar third molar Ten milligrams of thiamine were infiltrated intra orally in 5 patients, 100 mg was infiltrated intraorally in 2, and 100 mg were given intramuscularly to 2 in whom inflammation

(132) M ad S V Dis s of th Mouth 5th ed t on. C V Mosby Co St Lou s Mo 1940 pp 728 732

(133) Sm th J A Fox P P a d We nstei H R Curare-like a t on of thiamin S nc 108 412 Oct 15 1948

and edema prevented intraoral injection Muscular relaxation was observed in all patients after from 4½ to 25 minutes The quickest response was obtained by intraoral injections Muscular relaxation occurred simultaneously with pain relief when 10 mg of thiamine was injected intraorally and when 100 mg was injected intramuscularly In both patients given 100 mg intra orally muscular relaxation was observed in 15 and pain relief in 30 minutes The average elapsed time for the group was 13 minutes A typical case is reported

Case 6 A 35 year old woman was seen in the dental clinic on 23 April 1952 Her maxillary right first and second molars were extracted under 2 percent procaine The fracture of 3 roots necessitated the making of a flap and removal of some cortical bone Extirpation of the root tips was accomplished with a minimum amount of trauma The patient was comfortable until the following morning when she noted pain swelling and in ability to open her mouth The pain persisted throughout the day and night and was not relieved with aspirin She returned to the clinic on 25 April for postoperative treatment Examina tion revealed (1) normal healing of the site of operation with no apparent infection (2) slight edema of the soft tissues on the right side of her face and (3) acute trismus Her temperature was normal She complained of severe pain in the right maxilla which seemed to radiate into her temporomandibular joint Ten milligrams of thiamine was infiltrated in the mucobuccal fold in the region of the maxillary tuberosity Exacerbation of pain was experienced for 1 minute but complete relief of pain and trismus was obtained in 4½ minutes The patient had the im pression that the swelling had subsided but no change in the edema could be discerned objectively Her pain and trismus did not recur

Mechanism of action of thiamine Shub *(134)* used thiamine parenterally to relieve labor pains He found that it strengthened the uterine contractions and cut the duration of labor in half He suggested that thiamine retards muscle fatigue by stimulating the deposit of glycogen in the muscles and by inhibiting the formation of lactic acid and pyrotartaric acid Stone *(135)* in using intraspinal injections of thiamine in poliomyelitis observed a rapid restoration of normal strength in weakened muscles and attributed these beneficial effects to a restoration of the normal cell metabolism in neurons of the spinal cord Smith et al *(133)* demonstrated in animals that toe contractions resulting from stimulation of the isolated sciatic nerve are prevented by both

(134) Sh b P Th m f pa l l bo Am. Rev S M d 4 476 1947
(135) S S T e me f t p l my l R po ntraspinal dm tra l pyr d ne nd th mine hydrochlor d nd f cial f th py A h P diat 66 443-461 Oc 1949

thiamine and dextro-tubocurarine, although the muscle will still respond to direct stimulation Thus, they described the action of thiamine as being "curare-like "

Trismus, which in reality is an intensified muscle contraction, may be described as a state of unbalance between thiamine and acetylcholine Thiamine, but not cocarboxylase, has an inhibitory effect on acetylcholine *(23)* In maintaining this balance, thiamine is continously used up and must be replaced from other sources because the nerve cell is unable to synthesize this vitamin Stimulated nerves liberate amounts of thiamine many times greater than those given off by the nerves at rest *(22)* Acetylcholine is also liberated on nerve stimulation but to a greater extent than thiamine *(23)* Injury, trauma, and inflammation impair the nutritional influence of the nerve cell, permitting thiamine to diffuse and allowing acetylcholine to exert its affect on muscle The breakdown of adenosine triphosphate is the primary energy source for muscle contraction *(29)* and acetylcholine accelerates decomposition of adenosine triphosphate, thus intensifying muscle contractions *(136)* Until thiamine is replaced in sufficient concentration, muscular contractions persist.

It must be replaced in sufficiently high concentrations to counteract the effect of acetylcholine *(136, 137)* because in low concentrations it aids in the synthesis of acetylcholine *(138)* and intensifies the muscle contractions This is because the breakdown of adenosine triphosphate, by decreasing the concentration of thiamine, stimulates the formation of cocarboxylase *(23)* which catalyzes the decarboxylation of pyruvic acid into acetic acid *(22)* Acetic acid plus the enzyme cholineacetylase forms acetylcholine *(138)* and thus intensifies the action of the acetylcholine Thiamine in high concentrations inactivates acetycholine with the aid of cholinesterase

If this explanation of the muscle chemistry involved in trismus is to be accepted, it is seen that the oral administration of thiamine is of little or no value in its treatment In fact, in the initial phases of oral administration the muscular contractions would be intensified instead of being relieved Therefore, in the treatment of trismus, parenteral administration of adequate doses of thiamine is indicated Ten milligrams of thiamine for intraoral injection and 100 mg for intramuscular injection are believed to produce sufficiently high blood levels

(136) To da C. and Wolff H G Effect of thiamine on striated muscle Proc Soc Exper Bi l & M d. 56 89-91 Jun 1944

(137) Sadh D P Influence of thiamine on ctl n of cetylcholine on muscle Am J Phys ol 147 233 236, Sept 1946.

(138) T da C. and Wolff H G Effect of v tamin B, and cocarboxylase on syn th of cetylcholin Proc Soc Exper B l & M d. 56 88-89 Jun 1944

The clinically observed muscular relaxation in one half of the time required for relief of pain when 100 mg of thiamine was injected intraorally may be attributed to the difference in the mechanism of action in muscle chemistry and nerve chemistry when high concentrations of thiamine are locally injected. The nerve seems to be irritated or overstimulated temporarily, which delays relief but inhibition of the acetylcholine effect in muscle is enhanced rather than delayed

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ISOLATED DISLOCATION AND FRACTURE-DISLOCATION OF THE BASE OF THE FIFTH METACARPAL BONE

JAMES P AHSTROM Jr *Lieutenant MC USNR (1)*

ISOLATED dislocation of the base of the fifth metacarpal is so infrequent an injury that it is not mentioned in most text books The earliest known record of such a lesion was made by Tuckerman *(2)* in 1879 Since that time others *(3 9)* have described this condition Cotton *(10)* also mentioned the injury in 1910, but his account consisted chiefly of a sketch showing the appearance of a hand which had suffered a dorsoulnar dislocation of the base of the fifth metacarpal Assuming that Deutschlander *(11)* reported only 1 case, the entire number in the literature to date is only 19 Of these, 7 were reported in foreign literature *(11 15)* Because Tuckerman's report was unavailable, only 11 of the cases reported in the English journals were reviewed

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(1) Orthoped c Serv ce U S Naval H sp t l Oakland Calif t time of writing n w t th U S N vy R cru ti g Statio Off ce of N val Off c r Procurement San F a cisc Calif

(2) Tuckerman L B D locati n of fifth metaca pal bone backward right hand Tr n acti ns (Youngstown Oh o) 1 101 1879

(3) McWhort r G L Is lated and c mplete d locat n of fifth carpometacarpal j nt ope ope ati n Surg Clin c Ch cago 2 793-796 Aug 1918

(4) Buzby B F Palmar carpo-metacarpal dislocatio of fifth metac rpal (Tr ns act ons of th Ph lad lphia Ac demy of Surg y) Ann Surg 100 555-557 S pt 1934

(5) Roberts N and Holland C T I olat d d slocation of base of f fth *meta* ca pal Brit J Surg 23 567 571 Jan 1936

(6) Murl ss B C Fr cture-di locat n of ba of fifth m tacarpal bo e Brit J Surg 31 402 404 Apr 1944

(7) W tso Jon s R F ctures nd J nt Injuries 3d ed ti n *William & Wilk n Co* Baltimor Md 1943 v l 2 p 898

(8) Cl ment B L Fra tur -dislocat f base of fifth met carpal case report J B ne & J nt Surg 27 498-499 July 1945

(9) H pp H E S mpl is l t d d slocation of fifth metac rpo-hamate art c lation U S N v M Bull 45 945-950 Nov 1945

(10) C tt F J D slocat o nd Joint Fractures W B *Saunders Co* Philad l phia Pa 1910 p 383

(11) Deut chland K D ol rte Lux tion des V *Mittelhandknochens Zentr* Ibl f Chir 67 1393 1399 July 27 1940

(12) Hamman Uber d Lux t c rpo-metacarpea Deutsche Zt chr f Chir 2 3 287 296 Mar 1930

The base of the fifth metacarpal may be displaced in either of 2 directions It may lie in the palm anterior to the bases of the third and fourth metacarpals, or it may be displaced in a dorsal and ulnar direction The first type may be called a radiopalmar and the second a dorsoulnar dislocation Of the 11 cases reviewed 5 were of the radiopalmar type and 5 of the dorsoulnar type The eleventh case was probably a dorsoulnar dislocation *(10)*

A fracture involving the anteroradial aspect of the base of the fifth metacarpal and in some patients a large portion of the articulating surface, may accompany dislocation in either direction Of the 11 cases reviewed there were fractures in 3 Of these 2 *(6 7)* were radiopalmar fracture-dislocations and 1 *(8)* was a dorsoulnar fracture dislocation Murless *(6)* stated that the fracture could be visualized best in an anteroposterior roentgen projection with the forearm supinated In the cases here reported oblique views from either side of the base of the metacarpal were taken as indicated

Direct trauma to the hand is usually responsible for these injuries They may result from a direct blow to the ulnar aspect of the hand or from a blow delivered by the injured hand Waugh and Yancey *(16)* mentioned that Burk attempted to produce isolated dislocations of metacarpals experimentally on cadavers but fractures usually resulted Dislocations were produced however, when the anterior and posterior ligaments had been cut In view of the strength of these ligaments it may be assumed that these injuries are produced by trauma which is of a severe or, at least of an unusual nature

Radiopalmar displacement is probably the result of direct trauma in that direction If closed reduction is accomplished, it is possible that a dorsoulnar displacement may ensue because of the obliquity of the metacarpohamate joint and the pull of the extensor carpi ulnaris muscle This secondary displacement is especially likely if a fracture of the base accompanies the dislocation

Dorsoulnar dislocation is probably caused by several factors The original trauma causes a tearing of ligamentous structures in the area thereby loosening the attachment of the base of the

(13) Lus na C d by B A Lus ne lat ca po-meta pic mpl ta Mine med 2 472 475 N 17 1940

(14) P ug ie C d by M ttl L. Sul me ism d produzion d una lus na del IV V me p R d Chir 3 487 491 Oc 1937

(15) V lls J E nd d l Sel J M. Lux on d la ba e d l 5 metaca pia (mme ta os br 3 b) R or p y tra ma l 20 33-39 J ly 1950

(16) W ugh R L. nd Y nc y A G Ca p me pal disloc w h pa t la f m lta us d loca f ba f f ur h nd fifth metaca pals J B & J t Surg 30-A 397 404 Apr 1948

bone If a fracture is also present, the stability of the base of the fifth metacarpal is further decreased The pull of the ex tensor carpi ulnaris muscle, which has its insertion on the dorsal and medial aspects of the base, is then responsible for dis placement of the shaft and most of the base of the bone proxi mally, dorsally, and ulnad This displacement is aided by the



Figure 1 (case 1) Roentgenogram showing fracture of the medial portion of the base of the fifth metacarpal, most of which is displaced proximally and ulnad Similarity to Bennett s fracture-dislocation of the first metacarpal may be noted

fact that the metacarpohamate joint line is oblique from its centrodistal to its peripheroproximal point The resulting roent genogram in a dorsoulnar fracture-dislocation of the base of the fifth metacarpal is thus similar to that in a Bennett's fracture dislocation of the first metacarpal (fig 1)

Treatment of dislocations of the base of the fifth metacarpal has been varied McWhorter *(3)* and Buzby *(4)* obtained good re sults with open reduction in 2 patients with radiopalmar dis

location, in each of whom the injury was at least 2 weeks old Watson Jones *(7)* obtained a good result with open reduction and arthrodesis of a 7 week old radiopalmar fracture dislocation Murless *(6)* reported a good result following closed reduction, and immobilization with a nonpadded plaster splint of a radiopalmar fracture dislocation He attributed his success with closed methods to the fact that the injury was treated immediately Roberts and Holland *(5)* reported a patient with radiopalmar dislocation but gave no details regarding treatment or the end result

Roberts and Holland *(5)* reported 3 patients with dorsoulnar dislocation of the fifth metacarpal In the first a 53 year old man closed reduction failed and no further treatment was instituted Five months later it was estimated that he had 95 percent return of function In the second, reduction failed Examination 18 months later revealed weakness of grip on the ulnar side of the hand In the third a 31 year old woman skin traction was used to maintain the closed reduction but after 3 weeks redisplacement occurred Function was reported as good but the fifth digit had a tendency to drift into ulnar deviation when her hand was relaxed

Hipps *(9)* treated a patient with dorsoulnar dislocation of the base of the fifth metacarpal by closed methods He overcame the instability after reduction by maintaining the hand and wrist in a position of radial deviation As a result, the metacarpohamate joint line was transverse to the long axis of the forearm and the tendency for the fifth metacarpal to slip off the hamate was decreased The result was good and roentgenographic examination 6 months after treatment revealed maintenance of position

Clement *(8)* found that closed reduction of a dorsoulnar fracture dislocation of the fifth metacarpal was easily accomplished but that when the traction was released the displacement immediately recurred He was able to maintain reduction by a single Kirschner wire inserted through the proximal thirds of the third fourth and fifth metacarpals while the position was maintained manually When the wire was removed 4 weeks later there was a full range of painless motion

Four patients with isolated fracture dislocation of the base of the fifth metacarpal have been treated at this hospital recently In all of them the right hand was involved and the displacement was in a dorsoulnar direction All of the injuries were closed

CASE REPORTS

Case 1 Twenty four hours before his admission to this hospital a 100 pound bomb dropped on the right hand of a 21 year old man There was some swelling and tenderness on the dorsum

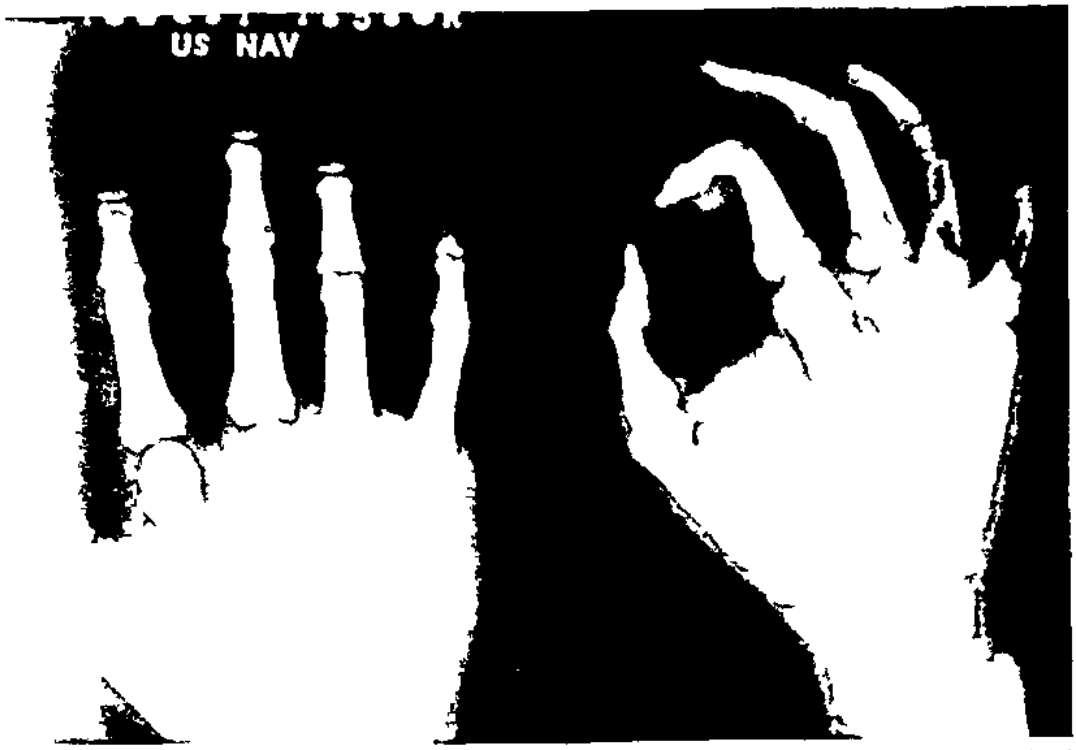


Figure 2 (case 1) In the oblique view some dorsal displacement of the fifth metacarpal base may be seen

of his right hand over the base of the fifth metacarpal, which appeared to be shortened His fifth digit was in an abducted position and there was pain on motion Roentgenographic examination revealed a fracture through the base of his fifth metacarpal,



Figure 3 (case 1) Three weeks after open reduction Position has been corrected One Kirschner wire has been removed The remaining Kirschner wire was removed the next day

with ulnar dorsal and proximal displacement of the shaft and most of the base of the bone (figs 1 and 2) After procaine was injected into his metacarpohamate joint the fracture dislocation was easily reduced by manual traction with pressure over the base of the metacarpal A nonpadded plaster cast was applied but it failed to maintain the reduction Ten days after injury the patient was taken to the operating room where the site of injury was exposed It was found that the small radiopalmar fragment was in reality several fragments the largest of which was surrounded by an osteoperiosteal shell This isolated core like portion of bone was removed and the dislocation was manu

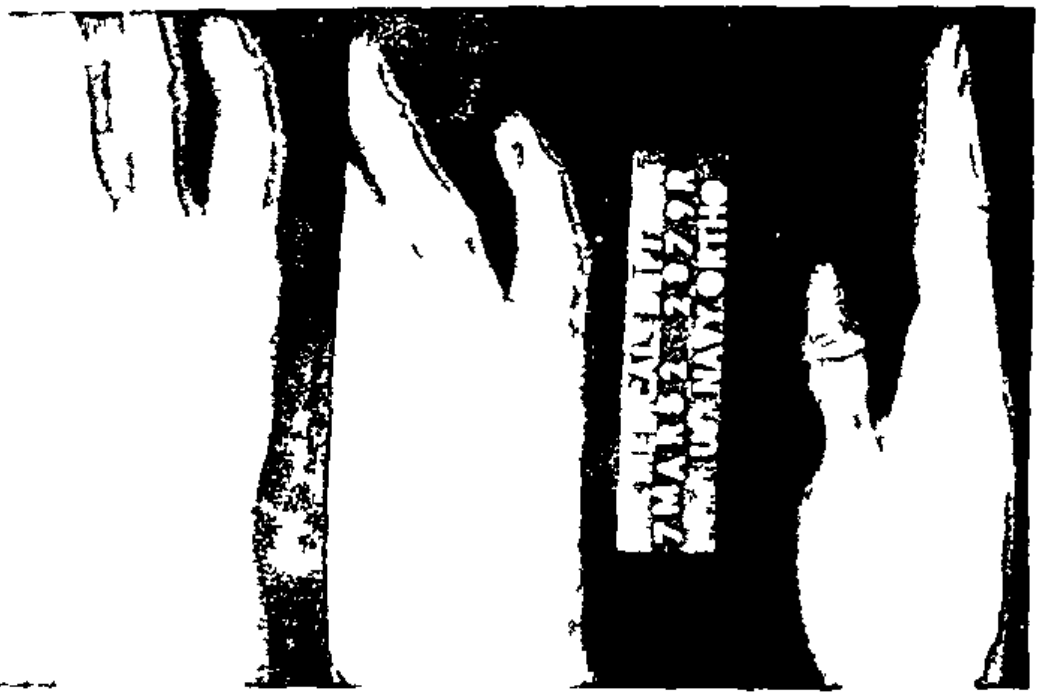


Figure 4 (case 2) Postoperative roentgenograms showing reduction

ally reduced The position was maintained by means of 2 Kirschner wires through the third fourth and fifth metacarpals and further protection was afforded by a volar plaster splint Twenty two days after open reduction the Kirschner wires were removed (fig 3) Function was complete and the anatomic relationships had been maintained

Case 2 A man struck his right hand against a post He noted pain and swelling on the dorsum of the hand and was admitted to this hospital 2 days after injury The clinical and roentgenographic findings were similar to those of case 1 Six days after injury an open reduction with internal fixation by crossed Kirschner wires was performed (fig 4) Thirty two days after operation when the wires were removed, the patient had a full range of painless motion

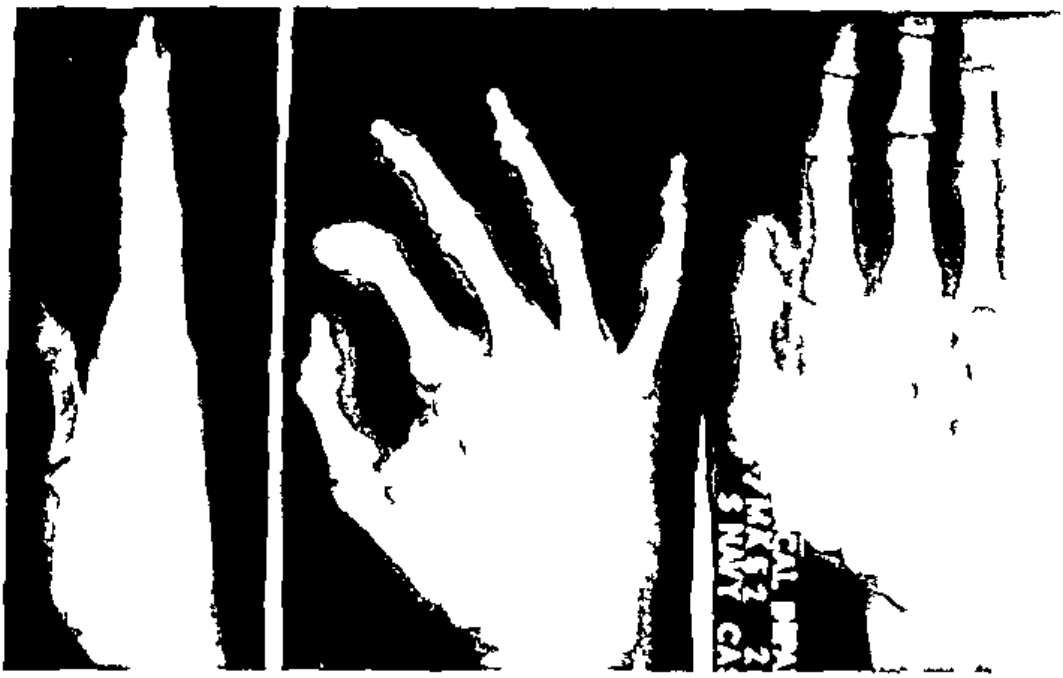
Case 3 A 21 year old man injured his right hand while engaged in a fist fight Three days after injury, he was admitted to this hospital where tenderness and swelling over the dorsal aspect of the base of his fifth metacarpal were noted Roentgenographic examination revealed a comminuted fracture of the radial portion of the base of his fifth metacarpal The remainder of the base and the shaft were displaced in a dorsoulnar direction (fig 5) A pressure dressing was kept in place until the swelling subsided and then active motion, within the limits of pain, was allowed Seven weeks after injury the patient still complained of pain on motion and of tenderness in the area of injury



Figure 5 (case 3) Roentgenograms showing fracture of the base of the fifth metacarpal and dorsal ulnar and proximal displacement

Case 4 A young man sustained an injury to his right hand while delivering a blow with it No history of manipulation was obtainable, but his wrist had been immobilized in plaster for 1 month Because this treatment produced little improvement, a second plaster cast had been applied 3 weeks after the first had been removed This cast also was left in place for 1 month, at the end of which time the patient resumed his work as a carpenter Two months later, or almost 5 months after the original injury, he was admitted to this hospital where palpable crepitus on active and passive motion at his fifth carpometacarpal joint was noted Roentgenographic examination revealed an old fracture at the radial aspect of the base of his fifth metacarpal The whole base was wider than usual and the medial portion of it was

more proximal and ulnad than normal (fig 6) Traumatic joint changes were evident The patient complained of pain in the area of injury on active abduction of the fifth digit shaking hands or gripping objects He also noted that leaning on the heel of the palm caused discomfort In order to relieve some of the pain a small fragment of bone was excised from the injured area Subsequent to this procedure the complaints were still present but of less severity



Figur 6 (a 4) Ro tg g ams t hen after a small p of bo w m d from the t of i j y Deformity and t a mat c chang s a evide t

DISCUSSION

There is a noticeable difference in the results obtained in th first 2 as contrasted with the last 2 patients This may be ex plained by the fact that anatomic position was not restored in th last 2 and traumatic joint changes developed The situation is similar to but of less severity than that seen in malunitec Bennett s fracture dislocations of the first metacarpal Of the 4 medial metacarpals the fifth has the greatest range of motion and its mobility is necessary to form the concavity of the palm and to maintain an adequate grip It is desirable therefore to maintain a good range of painless motion of the metacarpohamate joint, especially in persons who earn their living by using their hands Adequate reduction is necessary to restore the proper mechanics and muscle balance following any fracture or dislocation in the hand (17) In patients with long standing unreduced

(17) Bun ll S Surg y f h H nd 2d d J B L pp tt C Ph lad lph P 1949 p 242

dislocations exhibiting traumatic joint changes, it may be necessary to fuse the joint and thereby obtain relief from discomfort at the expense of mobility Watson Jones (7) obtained a good result from arthrodesis of the metacarpohamate and the intermetacarpal joints If an arthrodesis is performed, the concavity of the palm should be preserved by maintaining the fifth metacarpal in a position of flexion

SUMMARY

A review of the literature has revealed reports of only 19 cases of isolated dislocation of the base of the fifth metacarpal Of the 12 reported in English, at least 3 were accompanied by fractures, only 1 of which was a dorsoulnar fracture-dislocation of the base of the fifth metacarpal The proportion of radiopalmar to dorsoulnar dislocations was about equal A hypothesis to explain the mechanism of injury has been advanced Treatment in the past has been varied and good results have been reported by both open and closed methods of reduction

Four patients with dorsoulnar fracture-dislocation of the base of the fifth metacarpal were treated at this hospital These brought the known total for this specific injury to 5 Of these 4 patients, good results were obtained in the 2 treated by open reduction, and fair or poor results in the 2 treated by other methods

In order to obtain good results in either dislocation or fracture-dislocation of the base of the fifth metacarpal, anatomic position must be restored This can usually be accomplished best by open reduction with internal fixation, or by closed reduction with skeletal fixation When anatomic position is not restored, traumatic joint changes will probably ensue This is especially likely if a fracture accompanies the dislocation If the ensuing symptoms are of sufficient severity, it seems best to fuse the joint with the fifth metacarpal in flexion

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BOOK REVIEWS

Manual of Gynecology by *E Stewart Taylor* M D Professor and Head of the Department of Obstetrics and Gynecology, University of Colorado School of Medicine Denver Colo 204 pages illustrated Lea & Febiger Philadelphia Pa publisher 1952

The purpose of this manual is to "provide the medical student and the general physician with the basic essentials of gynecology " In so brief a text, only the essentials can be presented,

hence much historical data has been omitted A sufficient number of photographs of gross specimens are present but there are very few photomicrographs of histology or pathology References are given at the end of each chapter, but very little attention is given in the text to experimental work or the pathogenesis of disease Throughout the text the emphasis has been placed on the medical psychosomatic and endocrinologic aspects of gynecology with the understandable omission of gynecologic operations other than their indications and contraindications The medical and endocrinologic aspects are well presented and the section on infertility is excellent and practical The last chapter is devoted to hormones listing many proprietary compounds which the general practitioner will find useful

—Col H E Harrison MC USA

Shock and Circulatory Homeostasis Transactions of the First Conference October 22 23 1951 New York N Y directed by *Harold D Green*, M D Professor of Physiology and Pharmacology Bowman Gray School of Medicine Wake Forest College Winston Salem N C Sponsored by the *Josiah Macy Jr Foundation* New York N Y 245 pages illustrated Printed by Corlies Macy & Co Inc New York N Y 1952 Price $3 50

The subjects in this report have been well chosen The humoral vasoactive substances and metabolic derangements in shock are presented by Benjamin Zweifach This deals with vasodilator material (ferritin) and vasoexciter material and contains a great deal of information about these substances but little about their application to human problems Vasoexciter material is the first substance emitted in traumatic and hemorrhagic shock, but appears late after radiation Ferritin predominates in the early stage following radiation The mechanism of the enzymatic inactivation of ferritin is described The role of the nervous system in shock is discussed by John Remington E P Scharpey Schafer presents the sequence of events associated with acute and chronic hypotension after hemorrhage in man He also describes the delayed responses after hemorrhage The infectious element in shock is discussed by Jacob Fine The chapter by Francis D Moore on the therapeutic implications of current concepts of shock should be valuable to the clinician The inestimable value of arterial transfusion in the treatment of shock and the possible mechanisms of its action and the part which the adrenal corticoids play in shock are discussed The increased amount of the adrenal corticoids required by the organism after trauma is emphasized and the action of the corticoids on the vascular tree is described

One of the chief advantages of this book lies in its presentation of both sides of certain controversial issues

—Commander H A Lyons MC USN

PATHOLOGIC PHYSIOLOGY IN EPIDEMIC HEMORRHAGIC FEVER[1]

GIULIO J BARBERO *Captain MC, USA*
SIDNEY KATZ *Captain MC, USA*
HENRY KRAUS *First Lieutenant MC, USA*

IN order to evaluate the pathologic physiology of epidemic hemorrhagic fever, experienced observers in forward units in Korea were designated to select patients early in the course of the disease and arrange for their rapid evacuation to this hospital for study by a research group consisting of the authors and 5 technicians Through this program 20 patients were received in about the third day of their illness Normal controls were observed and serial and parallel studies were made on each patient To eliminate bias in laboratory examination, specimens were presented to the laboratory staff without indicating their origin Furthermore, as many of the determinations as time permitted were performed personally by medical officers of the research group This article presents the preliminary views on the pathologic physiology of epidemic hemorrhagic fever, as reported at the 1952 Far East Symposium on Epidemic Hemorrhagic Fever in Tokyo

The diagnostic criteria for the selection of patients for study were (1) characteristic history and physical findings, (2) albuminuria, (3) increased capillary fragility, (4) low specific gravity of the urine, and (5) active diuresis following the acute toxic phase No attempt was made to evaluate therapeutic measures such as the administration of benadryl or the use of convalescent blood

The first question raised was What is the common factor that explains the multitude of signs and symptoms? The most likely answer seems to be that the process is one of capillary damage resulting in increased capillary permeability The early development of periorbital and conjunctival edema concomitant with or followed by a period of hypotension supports this concept Also the hemoconcentration manifested by an increase in the hematocrit reading and the marked edema of the retroperitoneal tissues found at autopsy in patients dying early in the disease indicate that there is some sudden loss of plasma

(1) From the 21st Evacuation Hospital Korea

volume early in the acute febrile period In 40 of 56 patients in whom the spinal fluid was examined there was an increase in the spinal fluid protein without an accompanying increase in cells *(2)* It is not known whether this represents a specific reaction of the meninges to the etiologic agent or a direct result of increased capillary permeability in the choroid plexus

It further appears that capillary damage is not only manifested by increased permeability but that there is injury to the supportive stroma resulting in an increase in capillary fragility This toxic change is a primary factor in producing the protean manifestations of this disease Hemorrhage into any organ or at any site may occur with ensuing clinical findings that depend on where this hemorrhage takes place

Capillary fragility tests on our patients were performed by several technics The Rumpel Leede test was positive in all patients but was found inadequate as a method for serial studies of capillary fragility in the same patient We therefore used the Dalldorf technic of applying a negative suction of 200 mm Hg to an area 1 cm in diameter over the insertion of the deltoid muscle for 5 minutes and reading the number of petechias after another 5 minutes By this technic the number of petechias in normal subjects was less than 20 We observed wide variation in the petechial count among normal persons but found that the number observed serially in any such subject remained relatively constant This was not true in patients with epidemic hemorrhagic fever These observations led to the conclusion that serial changes observed in any person are more important than any single absolute value Because of the lack of absolute normal standards we are not prepared to state at what stage in the disease the capillary system develops abnormal fragility nor when it reverts to normal Our impression is that it becomes abnormal between the fourth and seventh day of the disease concomitant with the appearance of edema or immediately following it and reverts to normal usually in the second week occasionally in the presence of active bleeding

The next question raised was How does the increased capillary fragility produce the clinical phenomenon seen? One of the simplest explanations is local trauma We have observed the development of petechias on the body where it has been grasped in moving the patient particularly in the axillary folds and sides of the trunk The petechias of the soft palate and the nasal mucosa as well as the marked hemorrhages of the gastric mucosa appear related to the coughing and retching The bulbar

(2) Th l d f d g mb f p t h th th 20 l ct d f f mpl t dy

subconjunctival hemorrhages so often reported remained unexplained until one of our medical officers had a severe bout of vomiting, following which he developed massive subconjunctival hemorrhages in both eyes (He did not have epidemic hemorrhagic fever) On re-examination of our patients from this point of view we found that in every patient with subconjunctival hemorrhage there was a history of retching, vomiting, or severe coughing This explanation remained somewhat speculative until we observed 3 patients The first was free of ocular hemorrhages at the time of examination Later he began to retch severely and as he lay back following the episode, we watched huge hemorrhages develop in the periphery of the bulbar conjunctiva in both eyes The other 2 patients also developed subconjunctival hemorrhages following retching—hemorrhages which became larger with subsequent bouts of vomiting We have also observed the onset of epistaxis with each bout of coughing in several patients Similarly coughing and retching through sudden increase in pressure of the body fluids, may have been a factor in the development of xanthochromic and frankly bloody spinal fluid found in 5 patients This may be analogous to the development of cerebral hemorrhage from severe coughing in children with pertussis

If these hypotheses are true, an important addendum to therapy can be made Sedation with demerol or barbiturates may be of value by diminishing the retching and severe coughing and thus possibly prevent damage to the central nervous system We attempted to keep our patients well sedated during the acute phase of their illness

Hemorrhage occurred in a few patients, even in the presence of normal capillary fragility This caused us to look for some other explanation of the phenomenon Determinations were made of the prothrombin, coagulation, and bleeding time in our patients The prothrombin time was found to be normal Coagulation time was normal as determined by the Lee White method

Determination of the bleeding time, however, showed interesting results The methods used were the Duke technic of stabbing the ear, and the Ivy technic In the latter, a cuff is placed on the arm inflated to 40 mm Hg pressure and the arm incised to a depth of 2 mm with a No 11 Bard Parker blade The arm is allowed to hang in a dependent position and the bleeding time determined Results of the 2 methods were similar In about one half of our 20 patients the bleeding time varied from slightly above normal limits to 50 minutes In the rest it was normal During the acute phase of the disease there was often a marked increase in the volume of blood lost in the test, as distinct from the duration of bleeding time This was true even

in patients with normal bleeding time The rather profuse hemorrhage was frequently marked by a sudden cessation of bleeding The amount of blood lost during any given test seemed to diminish with each day s performance of the test To our knowledge this is an aspect of bleeding time which has not been well worked out Our impression is that the bleeding time is abnormal at the same time that capillary fragility is increased and returns to normal slightly before the reversion of capillary fragility to normal

Because of the bleeding time abnormality we looked to the changes in the platelet counts as a possible explanation Even prior to this study we had been impressed with the depression in the platelet count during the initial period of hemorrhage but knowing the unreliability of all platelet count methods we decided to repeat all abnormal counts Parallel controls and both the direct and indirect methods of counting were used In almost all patients with frank epidemic hemorrhagic fever the platelet counts were decreased sometimes to levels as low as 30 000 Serial counts showed an upward trend to normal limits over a 45 day period paralleling somewhat, but not exactly, the abnormality of the bleeding time We also noted large platelets about the size of or larger than red blood cells and similar to those found in thrombocytopenic purpura

No circulating megakaryocytes were seen Bone marrow studies showed no remarkable changes except for some hyperplasia during the leukemoid phase of the disease Megakaryocyte counts in the bone marrow were normal

SUMMARY

Epidemic hemorrhagic fever seems to cause toxic changes in the capillary wall resulting in loss of plasma into the tissues This results in edema hemoconcentration, and hypotension This is followed by a hemorrhagic phase in which the capillary fragility is increased the bleeding time is prolonged and the platelet count decreased The coagulation time is normal We found no obvious explanation of why the kidney, the pituitary, and the right auricle are peculiarly susceptible to the hemorrhagic diathesis

SEQUELAS OF EPIDEMIC HEMORRHAGIC FEVER IN THE CONVALESCENT PATIENT

JOSEPH H WATSON *Captain, MC USA*

THE sequelas of epidemic hemorrhagic fever were studied in 100 convalescent patients—patients in whom the febrile hemorrhagic, and uremic states had subsided sufficiently so that they could be up and about On casual inspection these patients appeared quite well, but after an interim history and physical examination were completed the symptoms and signs shown in table 1 were found to be persisting or recurring

Fatigue In this series 89 percent of the patients in the fourth week of disease, 56 percent in the sixth, and 40 percent in the eighth still complained of this symptom Weakness after walking 3 blocks or less was the criterion used Typical comments were "When I walk to the mess (80 yards) I'm too tired to eat" "I can walk a block, but I feel like lying down after I do", "I couldn't run if I had to" and, "I can walk to the PX (350 yards) but I have to stop and rest along the way " This weakness was out of proportion to comparable convalescent phases of other diseases

Polyuria Increased urinary output was noted in 78 percent of the patients in the fourth week, 52 percent in the sixth and 46 percent in the eighth Average 24 hour quantities were 2,036 cc in the fourth week, 1,736 cc in the sixth, and 1,751 cc in the eighth An increase in both frequency and quantity was noted Wide variations of urinary output occur in normal people, but in these convalescent patients it was our impression that the output exceeded that before they acquired epidemic hemorrhagic fever

Nocturia In the fourth week patients got up 3 times in the night to urinate in the sixth and eighth weeks they got up only once The average specific gravity of urine on one voiding between 0100 and 0500 hours of 10 patients in the sixth week was 1 014 (range 1 007 to 1 025)

Pain in the orbital area Aching in, behind, and above the eyes occurred in 83 percent of the patients in the fourth week,

in 41 percent in the sixth and in 33 percent in the eighth This pain was precipitated or aggravated by using the eyes (reading occupational therapy et cetera in 72 percent) Ophthalmolo ic examination failed to reveal any abnormalities Visual acuity in fact seemed to be above average 20/15 being the rule

TABLE 1 *Sympt m a d f nd pat nt conval g f m epid m b m rrhag c fev*

Sympt m		*Sig f c t lab t ry find ng*	
C mm	F t g	Common	Hyposth nur (F hbe g c c tr t on t st)
	Polyur		D m h d phe olsulf n- phth l e c t
	N tu.	U c mmon	El at d t m
	P		p ot i n tr g
	Blur		Ab o m l ECG s
	Pl		
U c mm	A		
S g			
T d			
g			
T r			
F			

dic and difficult to evaluate but in the patients and in the sixth week s symptom, no cause for which was

Photop b a t e tou th week 87 percent of the patients and in the s percent described either ocular dis comfort o tual pain on being exposed to bright light as in walking from the ward o doo s on a sunny day

Anorexia In 82 percent of the patients a full or even vora cious appetite had returned by the sixth week The rest could eat but had no interest in food

Abdominal pain was a common symptom during the acute phase Seventeen percent of the convalescent patients had a recurrence of this symptom associated with tenderness on palpation The location was not specific nor was any obvious cause present

Tenderness in the costovertebral angle was also common in the acute phase and persisted into the fourth week in 59 per cent of the patients into the sixth in 21 percent, and into the eighth in 8 percent

Trembling and nervousness Tremor of the hands and a sensation of nervousness was present in the fourth week in 96 percent of the patients and in the sixth week in 75 percent In 72 per cent, it appeared on attempting to use the hands as in writing Neurologic examination revealed no abnormalities

Failure to regain weight Weight gain was very slow and by the sixth week 70 percent of the patients had failed to regain their preillness weight This was difficult to evaluate accurately because scales are few and far between in Korea

Hyposthenuria Diminution in the concentrating power of the kidneys began in the acute phase after the first week of illness and extended well into convalescence The maximal value observed in the fourth and sixth weeks was 1 015 and in the eighth week was 1 020 These values were obtained by the 12 hour Fishberg procedure In 2 patients, isosthenuria was present 6 weeks after the onset of the disease

Diminished phenolsulfonphthalein excretion This test was selected because it is, in the main, a measure of the limitation of tubular excretory function imposed by diminished renal blood flow The amounts of excretion observed may have been a little high as a result of the use of the entire contents of 1 cc ampules which actually contained about 1 2 cc Tests were made every second week, and the average percent excreted in the first 15 minutes after injection was 16 percent in the fourth week 19 percent in the sixth, and 22 percent in the eighth

Elevated serum nonprotein nitrogen levels and those of other nitrogenous constituents of the blood are common during the acute phase but in general, fall to normal in the transition between the acute and convalescent phases Average values for serum nonprotein nitrogen were 44 4 mg per 100 cc in the fourth week, 39 1 in the fifth, 35 1 in the sixth, 27 in the seventh and 26 in the eighth Figure 1 shows average values for maximum concentration in Fishberg test, phenolsulphonphthalein excretion in the first 15 minutes, and serum nonprotein nitrogen levels

Electrocardiographic abnormalities One or more ECG s were taken on 45 patients and in 12 were abnormal In the acute phase, 6 were due to nonspecific myocardial involvement and 6 to electrolyte disturbance, especially hyperpotassemia In 2 patients the abnormalities were persistent One had an S type of intraventricular block and the other had what at first was thought to be hypopotassemic effect, but because of the persistence of T wave inversion in L_2, L_3 aV_F, V_5, and V_6 long after the patient was eating normally and all blood chemistries were within normal limits it was believed that the posterolateral

wall ischemic pattern was due to subendocardial hemorrhage in that area

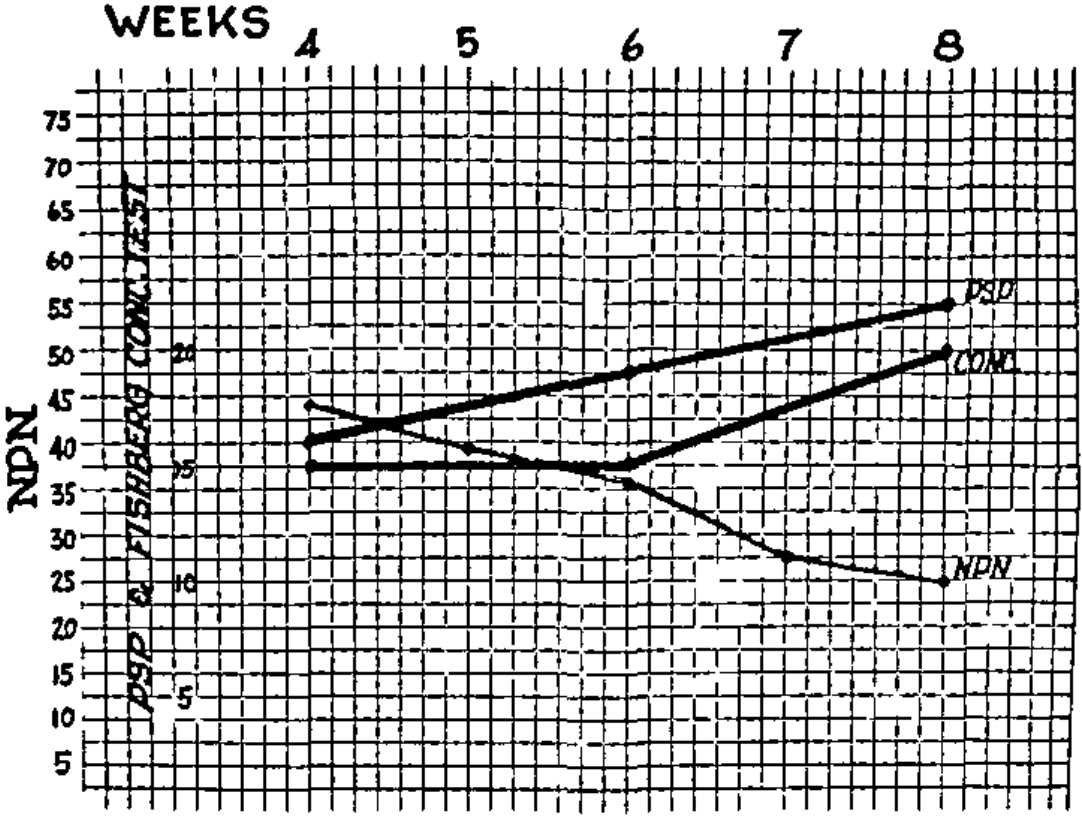


Fig 1 Average values for concentration tests with phenolsulfonphthalein excretion and serum nonprotein nitrogen following epidemic hemorrhagic fever

DISCUSSION

From this study it would seem that easy fatigability extends beyond that of the comparable convalescent phase of other acute diseases This is probably due to excessive protein catabolism and impaired renal function The increased protein breakdown is manifested by the high serum levels of nonprotein nitrogen and other nitrogenous waste products the excessive weight loss and the retarded weight gain in spite of excellent appetite and adequate calorie intake Renal damage with impaired excretory function is indicated by hyposthenuria and diminished phenolsulfonphthalein excretion The damage site would seem to be in the convoluted tubules because it is a decrease in tubular reabsorption rather than in glomerular filtration which causes the increase in urine volume and a decrease in specific gravity

Photophobia blurred vision and ocular pain were common but as yet no satisfactory explanation has been found Anorexia and recurrence of abdominal pain was infrequent but puzzlin Tenderness in the costovertebral angle is probably dependent of swelling of the kidney with capsular stretching similar to

that occurring in lower nephron nephrosis Trembling and nervousness are a further indication of the profound somatic disturbance which occurs in this disease Persistent electrocardiographic abnormalities, most likely due to hemorrhage into the myocardium, were infrequent (2 percent), but showed that lasting cardiac damage may occur

BOOK REVIEWS

Stereoencephalotomy (Thalamotomy and Related Procedures) Monographs in Biology and Medicine Volume I edited by *E. A. Spiegel* Part I Methods and Stereotaxic Atlas of the Human Brain by *E. A. Spiegel* M D Professor of Experimental and Applied Neurology Head of the Department of Experimental Neurology *Temple University* School of Medicine and Hospital Philadelphia Pa and *H T Wycis* M D F A C S. Clinical Professor of Neurosurgery Temple University School of Medicine and Hospital Philadelphia Pa 176 pages illustrated Grune & Stratton Inc New York N Y publisher 1952 Price $8

The development of stereotaxic instruments for operations on the human brain is recent The size and shape of the human skull varies so much in external reference points that dependence on these points for accurate localization of deep structures is unreliable For example, the authors showed that the pineal gland may be located from 4 to 20 mm posterior to the interaural plane Reference points within the brain rather than skull landmarks were selected in devising the human stereotaxic apparatus Spiegel and Wycis first described a stereoencephalotome in 1947, and since then have produced 2 models with simplification and reduction of its weight to 5 52 pounds

The experiences of neurophysiologists in the study of the deep ganglia of the brain and the recent advances in psychosurgery, surgery of pain, and the treatment of diseases of the basal ganglia provided the incentive for the development of stereoencephalotomy in humans The authors have pioneered in this field Their book describes the calculation of electrode position by means of a reference point determined with a standardized roentgenogram, pneumoencephalograms, and an exact knowledge of the position of the area to be destroyed in relation to the reference point. The apparatus including electrodes, the roentgenogram and operative technics, interpretation and measurement of roentgenograms, and the final calculations are all described in detail

The atlas is based on a study of 30 brains fixed in situ by intracarotid injection The photographs are made against a black background printed on a co-ordinate system marked off in milli

meters The center of the posterior commissure is used as a reference point because it is more constant than the center of the pineal gland *Tables of variability are included* For the sake of completeness, the glossary is in Latin, English, German, French Italian and Spanish The authors exercised good judgment in designating the structures in the atlas and in not duplicating the detailed descriptions of anatomy already found in texts devoted to that purpose References are made to current workers in this field in other countries but the authors have no personal experiences with the many types of human stereotaxic instruments used by other workers They do however desire further simplification of operative procedures

This monograph will help to establish operations on the deep structures of the brain on a sounder basis which will reduce damage to the cortex The authors present data on over 100 patients on whom they have operated Their follow up studies will determine the comparative usefulness of their technic The method will also clarify some problems in physiology of these deep ganglia in the human brain and help to correlate them with the animal studies

—*Lt Col R C Greenwood MC USA*

Phy iological Ba of Gyn cology a d Ob tetri by *S R M R yn ld* M A Ph D D S Dr ho caus St ff Member Phy i l g st De partme t of Embry l gy Carn g In t tut on f W hington Lecture n Ob t t c Th J hns H pkin Med al Scho l Baltimore Md Prof sor h or us F cult d d Medic na Univ rs d d d l R p bli Or t l d l Ur gu y Mo te ideo Ur guay 153 page Charles C Thoma Publ h Springfield Ill 1952 Pr $5 5(

Each chapter in this clearly and concisely written book is presented as an individual lecture The author presents several new concepts regarding the physiology of the female pelvic organs Of particular interest to the obstetrician are the chapters on (1) abnormal labor and incoordinate uterine action (2) uterine growth during pregnancy and (3) the physiologic conditions in the uterus at the onset of labor

The gynecologist would be most interested in the chapters dealing with (1) the physiologic basis of menstruation (2) the ovarian vasculature and ovarian function, and (3) the endocrine effects of hysterectomy

There is a valuable supplementary reading list at the end of the book Although this volume might not be of particular interest to the average practitioner it is highly recommended for all whose whole or partial interest lies in the fields of obstetrics or gynecology —*Commander G C Calderwood MC USN*

PATIENT TRIAGE FOR TREATMENT AND EVACUATION[1]

JAMES H FORSEE *Colonel MC USA* [2]

TRIAGE is the correlation of the time and place of the patient's care with the severity of his disease or injury It is the first labeling of patients for distribution rather than for evacuation To evacuate literally means "to empty" and this is not the objective sought in meeting the problems of mass disaster or the casualties of war Distribution underlies the whole system of evacuation as there is no point in sorting patients unless they are distributed selectively in accordance with their needs The further one gets from the front in military combat or from the scene of mass disaster, the more important proper distribution becomes The ultimate triage comes in the establishment of special centers to care for certain types of injury or disease These distinctions are emphasized because for the first time since the War Between the States, this country is evincing an interest in the possibility of mass disaster at home

The broad aspects of this subject include problems relating to psychiatry, medicine, discipline, and morale This article is limited to the more specific problems of military surgery It is hoped that the lessons learned by our Armed Forces may be readily translated to meet future problems in other fields

In the forward area, i e , within the army and more particularly the division area, battle casualties receive needed dressings, splinting, and sedation by trained laymen and are transported to aid stations and clearing stations for further care The clearing station is the focal point of triage The degree of urgency of treatment in each case is determined by the nature of the wound and its existent or potential complications Here casualties are sorted into those that require immediate surgical treatment and those that may be safely transported and distributed to medical facilities further to the rear but within the army area The distribution of battle casualties of any type to the fixed hospitals and specialized centers of the base area without the benefits of initial treatment occurs under the exigencies of certain tactical situations, such as the early phases of combat on a beach

(1) Presented at the Deans Orientation Program Army Medical Service Graduate School Washington D C. 28 April 1952

(2) Fitzsimon Army Hospital Denver Colo

head The use of the helicopter for transporting the wounded from forward areas to hospitals within the army area for initial treatment has been extensively employed in the Korean conflict

A small, "first priority surgical hospital is placed immedi ately adjacent to the clearing station This is the furthest point forward at which primary surgical operations can be performed (figs 1 and 2) Here the following essentials can be assured (1) an experienced group of surgeons, anesthesiologists and operating room personnel (2) simple x ray facilities (3) simp' but adequate operating room facilities (4) lighting and wat supply (5) reasonable accommodation under shelter (usual tentage) and (6) facilities to retain the more seriously wounde for from 7 to 10 days



F gur 1 Fi t p or ty urg al ho pit l n f eg o nd.

Triage and distribution at this point in the axis of transporta tion makes its first real appearance The slightly wounded ol dier certain casualties due to accidents and patients with cer tain phases of combat fatigue exhaustion or illnesses of shor duration may be retained at the clearing station and returned t the front without further distribution to the rear Operations a a first priority surgical hospital are confined to the most severel wounded whose condition does not permit further transportation to the rear This group comprises only about 9 percent of all casualties reaching the clearing station They require treatment for (1) the correction of profound physiologic disturbances that immediately endanger life (such as continued bleeding uncon trolled by first aid measures severe shock chest wounds pro- ducing respiratory distress and maxillofacial wounds with re- spiratory obstruction) and (2) arrest or prevention of infection

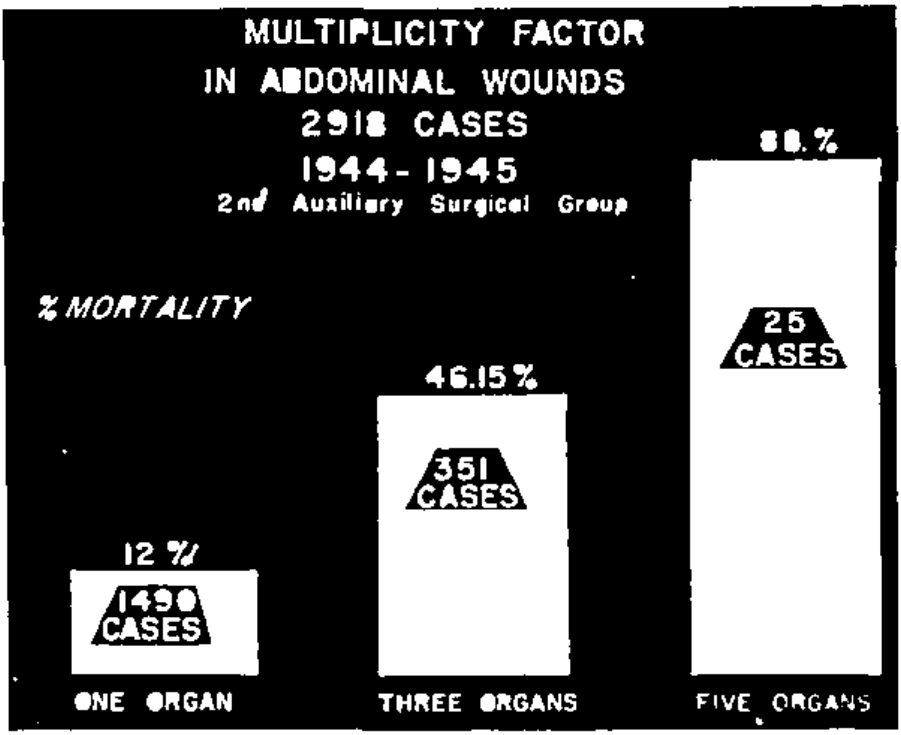
that if allowed to develop would endanger life or lead to grave disability (in patients with abdominal wounds, thoracico abdominal wounds, suspected gas gangrene, wounds of extremities with impairment of blood supply or transported with tourniquet in place, compound fractures of long bones and wounds with extensive muscle damage)



Figure 2 First priority surgical hospital operating team

To preserve the true function of a hospital of this type it is as important to prevent flooding with nonurgent cases as it is to direct to it the flow of proper cases Less than 5 percent of the most severely wounded admitted to first priority surgical hospitals in the Mediterranean theater were in such poor condition that they could not be restored to a status which permitted operation No matter what the operative risk, it must be accepted, or the patient is sure to die A well run first priority surgical hospital exerts a remarkably favorable effect on the morale of combat troops and their officers The divisional medical service receives a stimulus to maintain its arduous task by firsthand evidence that the lives of the most desperately wounded may be saved by skillful first aid measures and rapid distribution Splinting is improved the use of plasma in aid stations is increased, and the temptation of clearing stations to indulge in major operations for which they were not designed or equipped is removed

Certain factual data indicate the significance of proper triage distribution and care of the severely wounded. Between 1940 and 1945 the Second Auxiliary Surgical Group (of which I was commanding officer) operated on 3 532 patients for abdominal injury which represented two-thirds of the total number of casualties suffering abdominal wounds in the entire A E F of World War I The longer continued bleeding peritoneal contamination



Figur 3

infection and profound disturbances of physiology remain uncorrected the more serious is the prognosis The time lag from injury to operation is influenced by many factors including climate terrain distance road net, availability of airplanes tactical situation and medical facilities The increase in mortality in relation to increased time lag was carefully studied in a group of 2 303 patients with intra abdominal wounds during 1944 and 1945 In a group of patients with 1 organ injured the mortality rate for 557 operated on within 8 hours of injury was only 6 8 percent the rate for 617 treated from 8 to 16 hours after injury was 10 6 percent that for 142 treated from 16 to 24 hours after injury was 19 percent That there are other factors in addition to time lag is evident when the degree of severity of the wound as judged by the number of organs wounded is considered In this same group 44 patients with 4 abdominal organs wounded and treated within 8 hours of injury had a mortality rate of 50 0 per cent. When the interval was increased to from 16 to 24 hours, the mortality was 85 7 percent. This multiplicity factor may be further illustrated In 2 918 patients in whom 1 abdominal

organ, irrespective of which one, was injured, the mortality rate was 12 percent When 3 organs were injured, the rate was 46 15 percent (fig 3)

The need for triage and selectivity based on the urgency of the wound is also evident after patients are admitted to the first priority surgical hospital With increased experience and improved resuscitative measures, the time lag between hospital admission and operation was decreased In 1944 this interval averaged 4½ hours, but in 1945 it was decreased to 3½ hours Along with this experience there was a general decrease in mortality as illustrated in the surgical care of thoracico-abdominal wounds A reduction of mortality from 36 7 percent in 1943 to 20 percent in 1945 occurred (table 1)

TABLE 1 *Mortality rate in 903 patients with thoracico-abdominal wounds treated in first priority surgical hospital of the Second Auxiliary Surgical Group*

	Total	1943	Jan-June 1944	July-Dec 1944	1945
Patients	903	68	243	392	200
Deaths	247	25	84	98	40
Mortality rate (percent)	27 3	36 8	34 9	25 0	20

In the appraisal of the time lag from injury to operation, from admission to operation, and the selection of patients for operation after admission, several factors warranted careful study It became apparent that no matter how soon a patient with multiple organs wounded was operated on the mortality rate was very high and the rate increased with additional hours of time lag In fact, if these severely wounded patients are not operated on early, very few will live On the other hand, patients with a low "multiplicity factor" have a low mortality rate if operated on early With additional hours of delay, a gradual but significant rise in mortality rate is noted in this group also In effect, therefore, a patient with only 1 or 2 organs injured with a long time lag is likely to be in a serious condition, simulating a patient with a high multiplicity factor and a short time lag For example, a group of patients with 2 abdominal organs wounded and a time lag of 24 hours had a mortality rate of 40 percent and a group with 4 organs wounded and a time lag of 8 hours had a mortality rate of 52 percent.

About 90 percent of the wounded are cared for in the evacuation hospitals These hospitals require experienced professional staffs including all needed specialties Their staffs attain a high degree of proficiency in the procedures of initial wound manage

ment and are the backbone of the Army Medical Service Early in World War II observations of the selection of admissions to first priority surgical hospitals and evacuation hospitals based on the surgical urgency of the wound revealed interesting data which is shown in table 2.

TABLE 2 *S l ct o f adm b d o th g l g cy f w d*

Lo t on f wound	P rc nt of t t l dn s to	
	F tp rty s g l h p t l	Eva uation h p t l
Lppe e t mt	9 4	26
L w e t mt	35 0	45
Abd m	20 0	3
Tho x	19 3	9
Otl	16 3	17

In the rear areas base sections and the hospitals in the zone of the interior distribution based on selection of the wound reaches a high degree Specialized treatrent centers established for amputations, neurosurgery thoracic surgery plastic surgery, vascular injuries et cetera have been highly successful Distribution also becomes easier as the distance from the front increases and fewer errors result in getting the patient to the proper center

CONCLUSIONS

The basic concepts herein presented are adaptable to most situations concerned with the treatment of large numbers of casualties This presentation is based largely on experience in the North African and Mediterranean Theaters of Operations during World War II In addition to the official records and publications by members of the Second Auxiliary Surgical Group the writings of Dr E D Churchill (3 7) formerly the consultant surgeon in the above named theaters have been freely quoted

(3) Chur h ll E D Th p w d f bd m M B ll N h Afr Th Op (N 3) 1 2 6 Ma 1944

(4) Chur h ll E D Mod g ry mb w h cuat b d urg l urg cy f w d M B ll N h Af Th t Op (N 3) 1 7 8 Ma 1944

(5) Chur h ll E D T d d p th urg y M d h J Th a Surg 13 307 315 A g 1944

(6) Chur h ll E D Surg l m nag m t f w d d M d t th t f T ll f R m A Surg 120 268-283 S pt 1944

(7) Chur h ll E D Th Am urg A U S (M m m l 1 ctur) Surg Gy & Ob t 84 529-539 Ap (N 4) 1947

ANATOMIC LANDMARKS IN BLOCK ANESTHESIA OF THE INFERIOR ALVEOLAR NERVE

STUART FOULKE Captain, USAF (DC) (1)

THE complaint is often heard that certain local anesthetic solutions do not produce the desired result—that the anesthesia is produced too slowly or that it is not deep enough. In order to develop and maintain a sound local anesthetic technic it is necessary to (1) have a thorough knowledge of the anatomy of the structures involved and (2) be aware of the existence of, and be able to adapt the technic to, individual anatomic variations. The best way to become familiar with the anatomy of the nerves and adjacent structures involved is to dissect cross sections of the head and neck of a cadaver. Because cadavers are not readily available in sufficient numbers the next best method is to practice on the dry skull.

Because it is impossible to discuss here all of the local anesthetic procedures used in the practice of dentistry, this article will be concerned only with conduction anesthesia or block anesthesia of the inferior alveolar nerve (mandibular block). In a successful technic for accomplishing this, the landmarks used in selecting the injection site must be those that are individually fixed and yet can be correlated with one another in such a way that through their identification and use the operator will be able to circumvent individual anatomic variation. Most of these landmarks are points on the bone of the ramus of the mandible that are felt rather than seen. Some of these points can only be identified by projecting the palpation" into the depth of the soft tissues by the point of the needle.

LANDMARKS

Using a good source of light and having the patient open his mouth fully, one of the first and perhaps the most outstanding landmarks to be sighted is the rounded fold of tissue which appears to form the dividing line between the mouth and throat. This fold of tissue is commonly known as the pterygomandibular fold, buccal fold or molar fold and appears to connect the tuber ity

(1) Madigan Army Hospital Tacoma Wash.

of the maxilla with the retromolar fossa of the mandible (fig 1) The pterygomandibular fold is formed by the pterygomandibular raphe with an outer covering of mucosa



Figure 1 Photograph showing the facial landmark in the pterygomandibular fold. 2 Internal oblique line 3 External oblique line 4 Retromolar fossa

The pterygomandibular raphe is composed of the fascia connecting the superior constrictor muscle on the medial with the buccinator muscle on the lateral aspect and extends from the hamular process of the medial pterygoid plate to the mylohyoid line of the mandible The anterior border of the internal pterygoid muscle is almost directly posterior to the pterygomandibular raphe By placing the index finger of the left hand on the pterygomandibular fold it will be noted that this tissue is easily compressible By sliding the finger laterally another landmark is located This is the internal oblique line a hard rounded ridge beneath the mucosa and just posterior and lateral to the third molar tooth Continuing to move laterally the finger next palpates a shallow depression the retromolar fossa

The lateral boundary of the retromolar fossa is formed by a sharp ridge of bone which serves as another easily palpable landmark the external oblique line By moving the finger a very short distance laterally another structure which aids in the orientation of the landmarks previously discussed is found This is the anterior border of the masseter muscle (fig 2) a sharp muscular band which may be confused with the bony external oblique line unless its muscular texture is confirmed by having the patient open and close his mouth

The five landmarks revealed by palpation of the structures discussed above form the basis for a successful orientation of the operator in respect to the surface anatomy of that portion of the posterior part of the mouth concerned with inferior alveolar nerve block *(2)*



Figure 2 Cross section of head at the level of the mandibular foramen 1 Inferior alveolar nerve at level of mandibular foramen. 2 Ramus of mandible 3 Internal oblique line. 4 External oblique line 5. Masseter muscle 6 Internal pterygoid muscle 7 Buccinato muscle 8. Pterygomandibular raphe 9 Superior constrictor muscle 10. Parotid gland.

PRACTICAL APPLICATION

Anesthesia of the lower teeth is brought about by the blocking of the sensory impulses from the inferior alveolar nerve via the mandibular division of the trigeminal nerve in the pterygomandibu

(2) Seldon H M. Practical Anesthesia for Dental and Oral Surgery 3d edition Lea & Febiger Philadelphia P 1947

lar space *(3)* just before it enters the mandibular foramen The lateral wall of the triangular pterygomandibular space is formed by the inner surface of the ramus of the mandible its medial wall by the internal pterygoid muscle and its roof by the external pterygoid muscle The apex of this space points downward, being formed by the attachment of the internal pterygoid muscle to the angle and lower portion of the inner aspect of the ramus of the mandible Some of the most important landmarks in inferior alveolar nerve block are found in the ridges and grooves of bone on the inner surface of the mandibular ramus *(3)* (figs 3 and 4)

The insertions of the temporalis and external pterygoid muscles are shown in figure 5 The pterygomandibular raphe lies just anteriorly to the anterior border of the internal pterygoid muscle (fig 2) This is an important consideration in performing the inferior alveolar nerve injection because we wish to avoid entering the internal pterygoid muscle with the needle The external pterygoid muscle forms the roof of the pterygomandibular space and is therefore of little concern to us during inferior alveolar nerve block because it is so far above the site of injection

One of the most common misconceptions experienced in determining the location of the surface landmarks is a result of nomenclature The retromolar fossa which you would expect to find posterior to the molar teeth can be shown on the bony mandible to be lateral to the buccal surfaces of the molar teeth (fig 6) The internal oblique line is also lateral to this plane After the internal oblique line has been located it is easy to identify the pterygomandibular raphe a short distance medially (fig 7) With these two landmarks definitely identified the point of entry for the needle can be located Horizontally this point lies between the pterygomandibular raphe medially and the internal oblique line with its tendinous insertion of the temporalis muscle laterally If the needle enters either of these structures resistance is felt pain is experienced and the possibility of depositing the anesthetic solution at the wrong site is greatly increased

Vertically the plane of injection must be the same as that of the mandibular foramen This plane may be established by locating the point of least diameter *(4)* between the external oblique line and the posterior border of the ramus of the mandible (fig 8) The technic involved requires that the patient s mouth be from two-thirds to fully open. Use the index finger or the thumb to palpate the external oblique line to determine the deepest point of its concavity and place the thumb or third finger half way up on the posterior border of the ramus of the mandible

(3) S h H Or l An my C. V M by Co St L M 1949
(4) N rth p P M P l h dmu r t f loc l ne h s
J Am De t A 38 444 448 Ap 1949

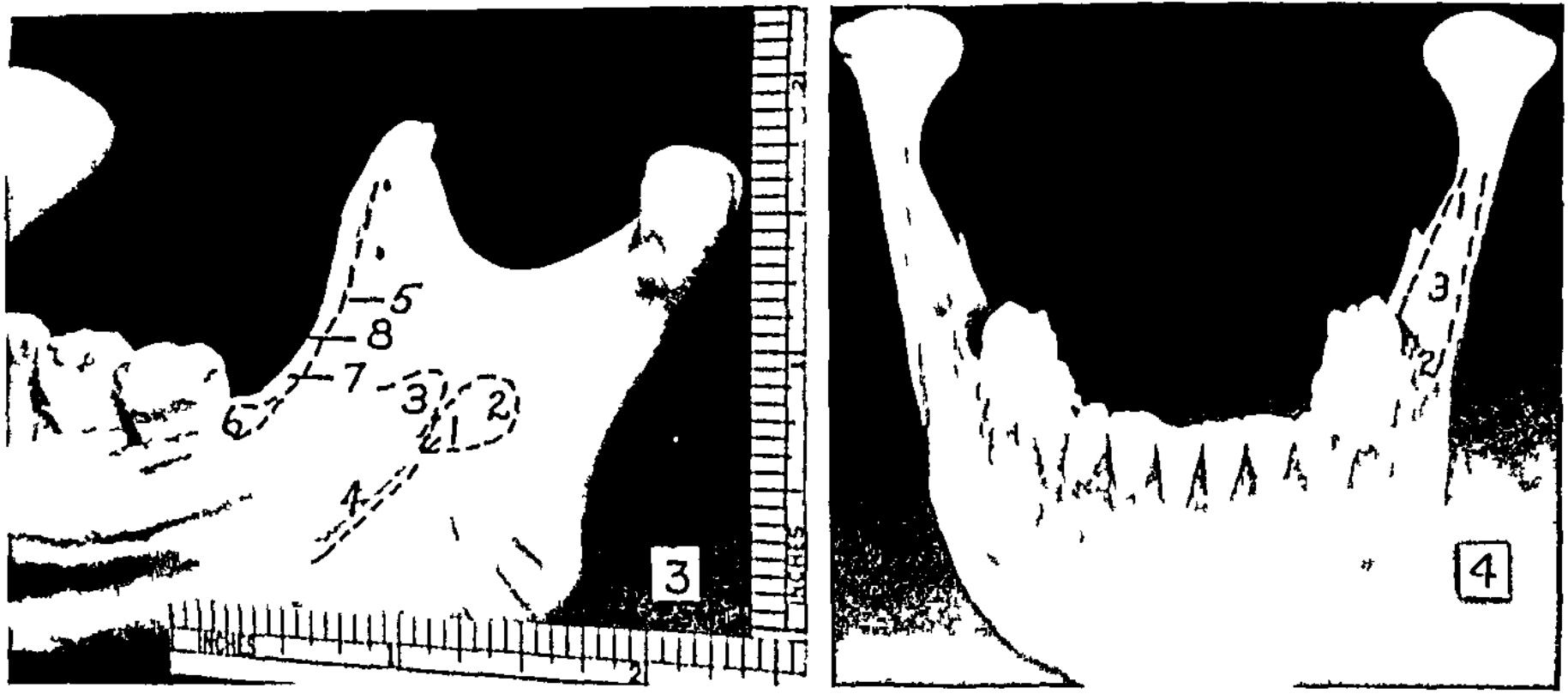


Figure 3 Internal surface of the ramus of the mandible showing the important bony landmarks. 1 Mandibular foramen. 2 Mandibular sulcus. 3 Lingula mandibulae. 4 Mylohyoid groove. 5 Internal oblique line (temporal crest). 6 Retromolar triangle. 7 Retromolar fossa. 8 External oblique line. Figure 4 Anterior view of the mandible showing the important bony landmarks on the ramus. 1 Internal oblique line. 2 External oblique line. 3 Retromolar fossa.

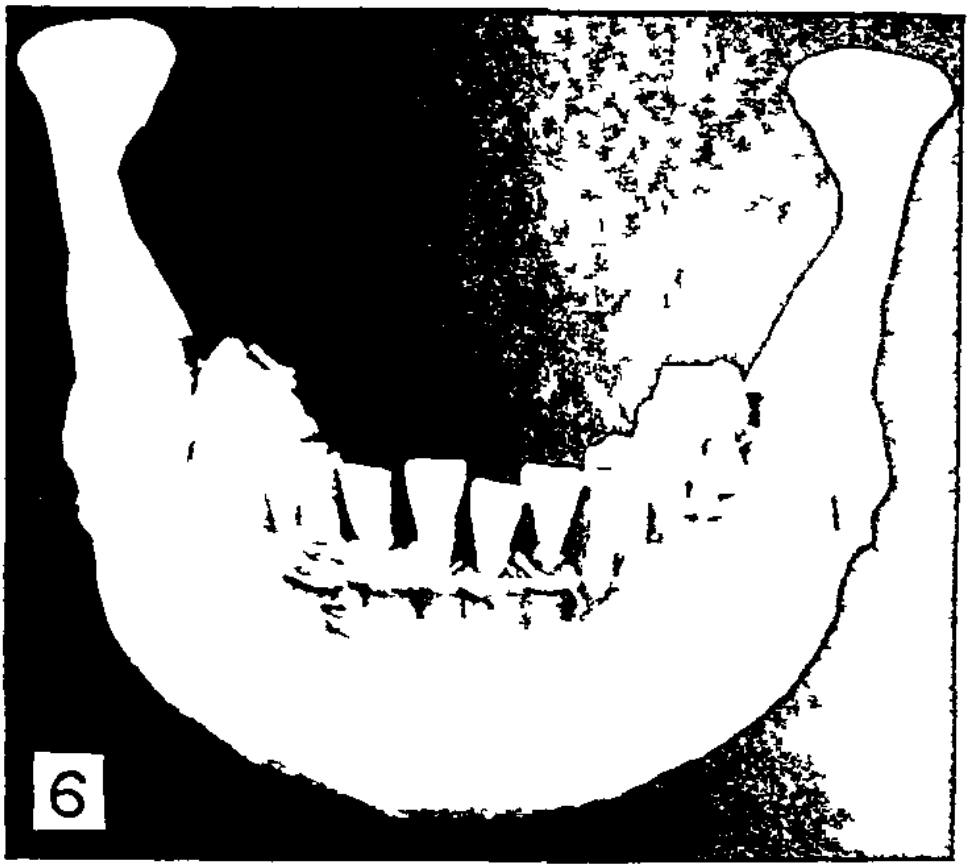
thus establishing a straight line between these two points On this plane the mandibular sulcus and foramen are found about two third the distance from the external oblique line to the posterior border of the ramus



F gur 5 C sect on of bead at the le l of the bead f th mand b la ondyle 1 Head of condyle 2 Coronoid pro c s 3 T mporal muscl 4 External pterygo d muscle.

Having determined the point of insertion the technic followed in reaching the mandibular foramen with the point of the needle is a matter of preference Some operators use a straight forward advance of the needle from the point of insertion until the foramen is reached and others prefer to follow the contour of the inner surface of the mandibular ramus In order to produce a satisfactory block it is necessary to deposit the anesthetic solution in the mandibular sulcus in close proximity to the nerve (fig 9)

The inferior alveolar nerve does not pass downward in close approximation to the inner aspect of the ramus but follows medi





F gu e 6 Anterior vieu of the rnand ble sbouing the etromolar fossa ard the internal oblique line to be late al to the plane formed by the buccal surfaces of the mola teeth. F gure 7 Photograph showing superf cial landmarks and the po nt to be considered for entry of the needle 1 Pterygomand bular f ld. 2 Internal oblique l ne 3 Point of insertion.

ally to the external pterygoid muscle (fig 10) At its lower border it turns outward at almost a right angle to the mandibular sulcus and does not touch the ramus except in the sulcus proper Mandibular ramuses vary significantly in width i e, distance from anterior to posterior border in angulation and in length

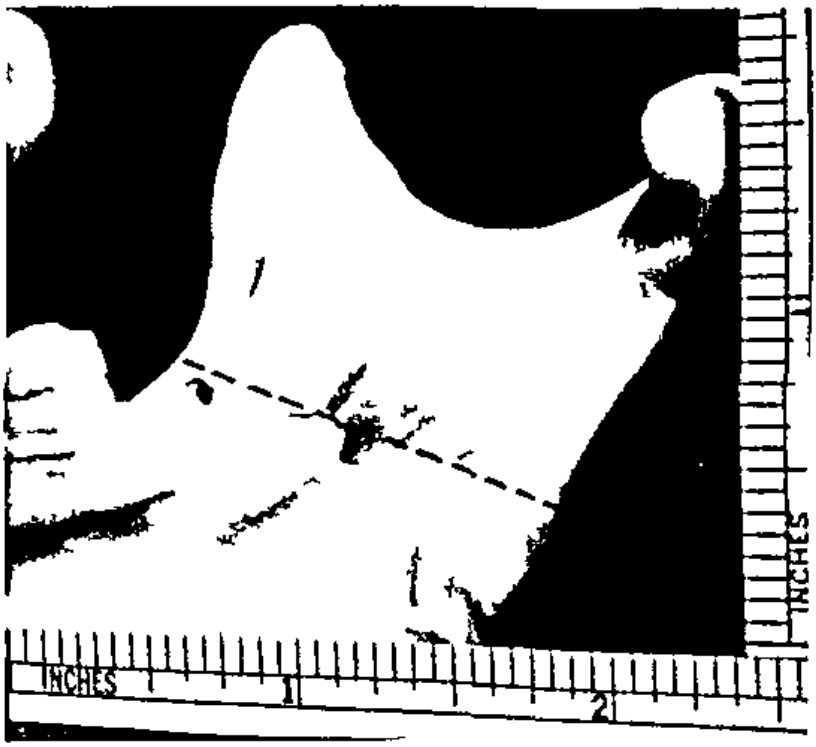


Fig 8 Internal surface of the ramus of the mandible showing the mandibular foramen to be located centrally on the plane of least diameter (dotted line)

(fig 11) For this reason inferior alveolar nerve block technic must be based on certain definitely located landmarks with due allowances for individual variation, rather than an arbitrary system of distances and angles

Inadequate anesthesia may result from injecting the anesthetic solution too high too low too far medially or before reaching or after passing the mandibular foramen

Trismus and pain in swallowing and masticating may result from injecting too high (external pterygoid muscle) too low (internal pterygoid muscle) or too far medially (fig 12) (internal pterygoid buccinator and superior constrictor muscles) *(2)*

If the anesthetic solution is injected beyond the mandibular sulcus and into the parotid gland (fig 13) there is danger of blocking branches of the facial nerve with a resultant temporary paralysis of the facial muscles on that side *(2)*

Figure 9 Cross section of head at the level of the mandibular foramen leaving one of the solution forms deposited at the individual foramen in close proximity to inferior alveolar nerve. *Figure 10* Cross section of head at the level of the condyle. 1 Head of the condyle 2 Inferior pterygoid muscle 3 Inferior alveolar nerve and vessels

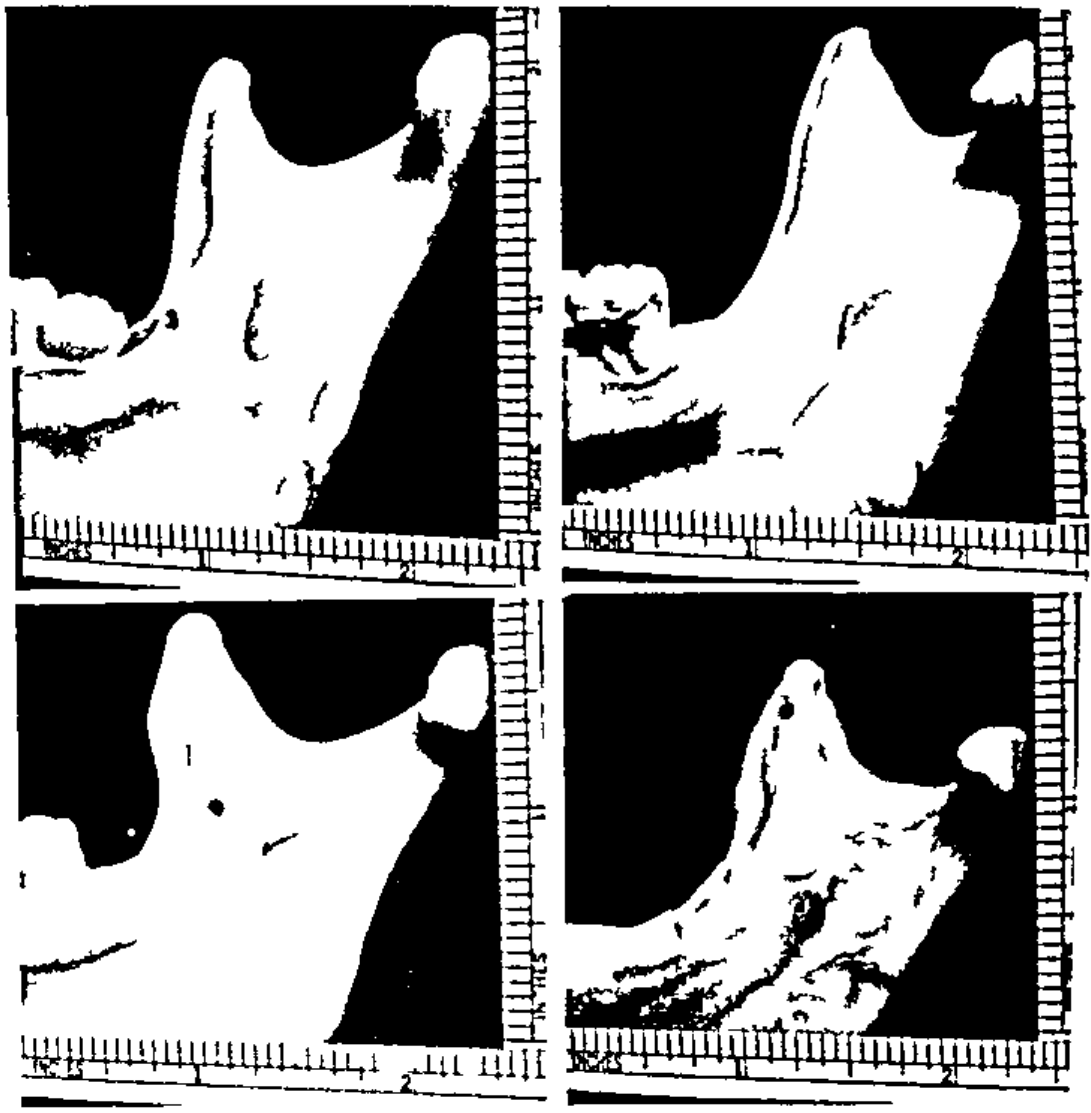


Fig 11 M d l s face of the m of f w mand bl bowi g ndiv dual ar t ons. Compar al w th f gures 3 and 8





Figure 12 Cross section of head at the level of the mandibular foramen showing the anesthetic solution being deposited too far medially (in the substance of the internal pterygoid muscle) Figure 13 Cross section of head at the level of the mandibular foramen showing the anesthetic solution being deposited too far posteriorly (in the substance of the parotid gland)

If the needle is carried beyond the posterior border of the ramus there is a possibility of entering the posterior facial vein (fig 13) *(4)* This may be prevented by determining the width of the ramus in the plane of the mandibular foramen before the injection If the anesthetic is deposited at the mandibular sulcus or foramen it is possible to enter the inferior alveolar artery or vein because of their close approximation to the inferior alveolar nerve

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BOOK REVIEW

T tbook of Surg ry d t d by *H F M l y* M A D M M Ch (O)
F A C. S F R C S (Eng) F R C. S (C) Ass t t Pr fessor
f Surge y M G ll Uni e s ty A te Surge R y l V ct ri
H p tal M nt al C nad w th f w d by *G G M ll* M D
C. M M S F R C. S (C) F A C. S Ch ma f th S g l
D p tme McG ll U i ity Surg on in-Chief R y l V to ia
Ho pital Mo tr al Ca ada *896 pag 460 t t ill str tio d*
46 ol pl t C V M by C St L M publ sh rs 1952
P $15

This book is the joint effort of 28 contributors all connected with the Royal Victoria Hospital and McGill University It is interestingly written and the subject matter is all inclusive The first chapter is on the evolution of modern surgery, a fascinating subject with which every medical student should be familiar The fields covered include chemotherapy preoperative considerations anesthesia plastic surgery neurosurgery diseases of the face mouth and neck vascular surgery thoracic surgery urology orthopedics and those subjects normally considered as general surgery Subjects are in general discussed under the subheadings historical considerations anatomy, physiology embryology, pathology clinical findings and treatment. Dr Miller states in the foreword The undergraduate must be taught the principles of surgery the appreciation of clinical signs and symptoms, and methods of examination so as to arrive at an accurate diagnosis This text emphasizes two aspects of teaching namely visual aid and brevity of description " Each section is followed by an adequate bibliography The volume is well illustrated with photographs and excellent color plates by Netter It is particularly recommended for students, interns and residents

—*Col W A Todd Jr MC USA*

PULHES

The Physical Profile Serial System

EUGENE C JACOBS *Colonel MC U S A. (1)*

IN 1943 the Royal Canadian Army, in order to economize in the use of its manpower, adopted a method of physical classification which had been previously used in industry It was called the PULHEMS classification This system permitted each soldier to be used to his maximum capacity in a military assignment which would take his physical limitations into account. In a sense the PULHEMS classification was a form of "job specification" which could be interpreted and used for assignment purposes by nonmedical personnel, but before it could be fully utilized, it was necessary to analyze and to establish a minimum profile for each job in the Army Furthermore the role of the unit, whether it be combat, support, or base operations had to be considered This system of classification proved to be highly satisfactory to the Canadians In 1945 it was adopted by the United States Army for its enlisted men and was called the PULHES Physical Profile Serial System In 1952 it was further applied to the officer personnel

THE NEED FOR A PHYSICAL PROFILE SYSTEM

Today the great weakness of the United States is its lack of manpower *(2)* We have only 6 percent of the world's population as compared with 32 percent for our potential enemies *(3)* If this country would attempt to counterbalance such tremendous manpower shortages it is essential that every effort be made fully to develop and effectively to use our existing manpower resources *(4)* We cannot afford to underutilize the skills and training of our men and women. No problem that we face is more important than proper utilization We cannot afford round pegs in square holes *(5)* Presently, the best

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(1) Physical Standards Div Office of Surgeon General U S Army [illegible] time [illegible] writing.

(2) Twenty-Sixth Report Prepared by Subcommittee U S Senate Committee on Armed Forces 11 Jan 1951

(3) Mutual security program Armed Forces talk No 406 p 10 May 9 1952 U S Government Printing Office Washington, D C.

(4) Rusk H A Garrett J F Wisted H., Jr and Taylor E J Employability of chronically ill and disabled (Commission on Chronic Illness) J A M A 149 595 597 Jun 7 1952

(5) Rosenberg A M. Selection of Military Manpower—A Symposium National Academy of Sciences National Research Council 1951 pp 41 42

substitute for manpower is a high degree of military proficiency To obtain this there must be a well co ordinated and balanced rationing of human resources based both on a person s technical skill and his physical capacity to perform certain functions The physical profile serial system provides a mechanism for classifying a person according to his physical fitness and his functional ability

THE PHYSICAL PROFILE SERIAL SYSTEM

In this system the human functions are considered under 6 factors (6 7) each factor being designated by a letter the significance of which is as follows

P—Physique, or general physical capacity
U—Upper extremity
L—Lower extremity
H—Hearing and ears (defects or disease)
E—Eyes (defects or disease) and vision
S—Neuropsychiatry

Each of these factors is considered and given a separate grade ranging from 1 to 4 according to a person s functional ability in that factor Number 1 represents higher than average efficiency *with minimal or no physical defects* 2 *indicates average* efficiency with a mild physical defect, 3 represents below average efficiency with a moderate physical defect which must not prevent the performance of some military duty in a satisfactory manner and must not be progressive in nature (grades 1, 2 and 3 are acceptable for military service) and 4 indicates poor efficiency due to a marked physical defect which renders a person *unacceptable for military service except during* a national emergency when specifically authorized by special directive

When the physical profile serial has been completed there is a sequence of six numbers e g 213111 To facilitate assignment the various combinations of numbers in the physical profile serial are grouped into the following categories

A—A profile in which lowest number is 1(e g , 111111)
B—A profile in which lowest number is 2 (e g , 112111)
C—A profile in which lowest number is 3 (e g 211113)
E—A profile in which lowest number is 4 (e g , 412112)

A person with an A or B category is considered as acceptable for general military service A person with a C category is also acceptable for military service but, because of his physical defect some consideration may have to be given to his assignment

(6) Sect II AR 40-115 20 Aug 1948, including Change No 1 and 2
(7) Sect II, AR 40-105 9 Jan 1952 including Change No 1 and 2

ment. A person with a C category may be sent overseas, but it is not intended that he should be used in combat. A person with an E category is not generally acceptable for military service, but when a man is accepted into the service in an A, B, or C category and later on, through disease or injury, becomes classified in an E category, he does not of necessity have to be separated from the service. He may be retained or even re enlisted provided that he is of value to the service and that there is no danger of his physical defect being aggravated by further military service *(8)* When such a person is of doubtful value to the service, he would normally appear before a medical board so that his usefulness could be determined. When the physical category B, C, or E are recorded, a brief description of the physical defect in nontechnical language must accompany the physical profile serial report *(9)*

In certain instances, additional information may be given in the physical profile serial by attaching a code letter as a suffix:

R—Indicates a defect which is remediable by corrective treatment and does not prevent a person's use in the military service.

T—Indicates a defect which is temporary in nature, and which, though it might be disqualifying if it persisted, could be so corrected by treatment that the person would become physically qualified.

D—Indicates a defect, which under current directives *(10)* is permanently disqualifying for overseas service. The suffix D can be removed only by a medical board. The basic policy for overseas service is contained in paragraph 11, SR 55 760 1 which states "Any individual considered physically qualified for duty in the zone of interior, * * * is also considered qualified for overseas service * * * *"

Profile serials having the suffix R or T unless automatically released by a time factor specifically stated on the profile certificate, must be reviewed every 3 months until the defect no longer exists, at which time the suffix is removed by a designated profiling officer or board. The physical profile serial system is generally recognized as an important step in the process of achieving the utmost in the utilization of man power. Great care is necessary in its accomplishment. The procedure is described in detail in Section II, AR 40-115 for enlisted personnel and in Section II, AR 40 105 for officers.

(8) Paragraph 8, AR 40-115.
(9) Paragraph 9, AR 40-115.
(10) Paragraph 16c(1), SR 600-175 20.

THE INITIAL PROFILE SERIAL

At the completion of the physical examination of each enlistee and inductee at an Armed Forces examining station or a main recruiting station a designated medical officer accomplishes an initial profile serial and enters it along with the physical category in space 76 on the Standard Form 88 and also on the DD Form 47 (Record of Induction) or the DD Form 4 (Enlistment Record United States) whichever is applicable *(11 12)*

VERIFICATION AND/OR REVISION OF THE PROFILE SERIAL

By a designated medical profiling officer At the (1) induction station *(13 14)* (2) reception center *(15)* (3) overseas command in the case of overseas returnees (4) hospital or other medical installation in the case of patients prior to return to duty *(16)* (5) overseas replacement depot prior to overseas assignment, or (6) any unit when warranted in the case of permanent personnel assigned to the unit for duty each person concerned is interviewed and if necessary examined by a designated medical profiling officer to ascertain whether or not the recorded physical profile serial is a true reflection of his actual physical condition If a man s unit commander or a classification and assignment officer are available it is desirable that they assist the profiling officer in the verification and revision of the physical profile serial On completion of the physical profile serial the profiling officer submits a letter report *(17)* to the man s unit commander so that he may effect the necessary assignment of the soldier within the unit and may make an appropriate entry on his records If any change in the soldier s military occupational specialty (MOS) number or assignment to a different unit is anticipated by the profiling officer the profile certificate must be routed through the classification and assignment office for necessary action prior to being mailed to the unit commander

By a profile classification board The profile classification board consists of a medical officer (preferably one experienced in profiling) assisted by a line officer (the soldier s unit commander or his training officer) and a classification and assignment officer At the (1) training division or replacement training center at or near the seventh week of basic training *(18)* (*)

(11) Par gr ph 12b(6) SR 615 100-1
(12) P gr ph 14d(1) SR 615-180 1
(13) P gr ph 13 SR 615 100 1
(14) P gr ph 21b(1) SR 615 180-1
(15) SR 600-510-5
(16) SR 600-145 11
(17) P gr ph 9 d 10 AR 40-115
(18) P g ph 10 (1) Ch g 2 AR 40-115

home station of soldiers in preparation for oversea replacement, except those in training division or replacement training center *(19)*, (3) reception stations (only when oversea returnee is to be assigned to permanent duty), or (4) hospital in the case of the retention and utilization of partially disabled personnel *(20)* each person concerned is interviewed and, if necessary, examined by the profile classification board to ascertain whether or not the recorded physical profile serial is a true reflection of his actual physical condition Recent physical fitness tests *(21)* are considered in determining the appropriate physical profile serial On completion of the physical profile serial, the profile classification board submits a letter report *(17)* to the soldier's unit commander so that he may effect necessary assignment of the soldier within the unit and may make appropriate entries on his records If any change in the soldier's MOS number or assignment to a different unit is anticipated by the profiling board, the profile certificate must be routed through the classification and assignment office for necessary action prior to being mailed to the unit commander

PULHES PROBLEMS

Recent inspections of class I and class II hospitals reveal that some commanding officers have not designated medical profiling officers as is required by paragraph 9b(1) AR 40 105 and paragraph 9b(1) AR 40 115 which states "The commanding officer of the hospital will designate one or more officers who will be responsible for all profiling at that installation" In these hospitals, the physical profile serials are being accomplished by each ward officer and noted on the clinical record when the patient is returned to duty Some of these ward officers have had very little experience in the application of the physical profile serial As a result, the profiles are being accomplished in a great variety of ways Many errors and omissions are occurring in the profiles of patients returning to duty The brief nontechnical description of the physical defect is frequently omitted, suffixes R, T, and D are occasionally misused, and, in a few cases, the profiles and/or profile certificates are not accomplished.

As a consequence of such profiling, the classification and assignment officer has difficulty in assigning appropriate MOS numbers In some cases the profile certificates are completely bypassing both the profiling officer and the classification and assignment officer when the recorded profile would appear to

(19) Paragraph 16 SR 600 175-20
(20) SR 600 145 15
(21) Chapter 17 FM 21 20

warrant a change in the MOs number This occurs because the ward officer mails the certificate directly to the unit commander

It was the intent of AR 40 105 and AR 40 115 that all profiling for each Army hospital and other medical installation be accomplished by one or more designated profiling officers at a central office in the presence of and with the aid of a classification and assignment officer Paragraph 6h, AR 40 105 states that "The profile will be utilized by the responsible classification officer as an administrative procedure in assessing the individual s ability to fill certain duty assignments A close relationship must therefore exist between the medical (profiling) officer and the classification officer * *

In some cases it appears that the classification officers have not been adequately trained to interpret physical profile serials and to assign appropriate MOS numbers It is intended to send such officers to the Adjutant General s School in the near future

Some unit commanders have not been giving proper attention to the physical profile serials and to the MOS numbers as a result many complaints have been made by soldiers to parents and congressmen A request has been made to the Army Field Forces to have all unit commanders instructed in the use of profile serials and the MOS numbers

It appears that some unit commanders and classification officers when senior to the medical officer on the profile classification board, have tried to dictate the "findings to the board.

Paragraph 10c Change No 2 of AR 40 115 states that the medical officer will be assisted by the line officer and the classification officer

USE OF THE PROFILE SERIAL SYSTEM

To function successfully a system of this type must have no weak links it must be correctly applied by the medical officer so as to represent truly the soldier's ability to perform military service it must be strictly translated by the classification officer into the proper MOS number in order to assign the soldier to the appropriate unit, and it must be carefully considered along with the MOS number in assigning the soldier to military duties within the unit. This analysis and use of a person s physical and mental status as recorded in the profile serial will play an important role in the soldier's future military assignment as well as his performance of duty Every effort must be made to impress those concerned with the profile system of its importance and to instruct them in its correct use

SUMMARY

In 1943 the Royal Canadian Army adopted the PULHEMS Classification from industry in order to economize in the use of its manpower It permitted each soldier to be used to his maximum capacity in a military duty with which his particular limitations would not interfere With slight modification the United States Army adopted the Physical Profile Serial System for enlisted men in 1945 and for officers in 1952 It was called the PULHES system and is rapidly becoming an important step in the placing of the right man in the right job—a job that he is physically qualified to perform This system is permitting the Army to reach a high degree of military proficiency, which will greatly assist in the counterbalancing of manpower shortages—America's great weakness today

BOOKS RECEIVED

Tuberculosis by *Saul Solomon,* M D Associate Visiting Physician Fourth Medical Division Bellevue Hospital New York Associate Clinical Professor of Medicine New York University Post-Graduate Medical School 310 pages illustrated Coward McCann Inc New York N Y publisher 1952 Price $3 50

Office Psychiatry The Management of the Emotionally & Mentally Disturbed Patient by *Louis G Moench* M D Assistant Clinical Professor of Medicine and of Psychiatry University of Utah School of Medicine 310 pages illustrated The Year Book Publishers Inc Chicago Ill publishers 1952

Surgery of the Eye by *Meyer Wiener* M D Emeritus Professor of Clinical Ophthalmology Washington University School of Medicine Honorary Consultant Ophthalmology Bureau of Medicine and Surgery U S Navy and *Ha old G Scheie* M D D Sc F A C S Associate Professor of Ophthalmology The Medical School and Hospital and Assistant Professor of Ophthalmology Graduate School of Medicine University of Pennsylvania Ophthalmologist The Children s Hospital of Philadelphia 3d revised edition 449 pages illustrated Grune & Stratton Inc New York N Y publishers 1952 Price $15

This Hospital Business of Ours by *Raymond P Sloan* 331 pages illustrated G P Putnam s Sons New York N Y publishers 1952

ARTICLES BY PERSONNEL OF THE MEDICAL SERVICES OF THE ARMED FORCES PUBLISHED IN OTHER JOURNALS

Be y B H Cap MC AUS d H ll d M H Lt Col MC USA V l ulus in wbor w h l hemor hag port f unusual ca Ar h Pedia 69 A g 1952

By V A C l USAF (MC) N w Air F m nat for fly g T xa J A d 48 630-634 Sep 1952

G ll y T E Cap USAF (MSC) N ght tr g USAF Sch l f A ia Med J A ia Med 23 490-494 529 O 1952

H nry J P Ball g E R Cap USAF (MC) Mah P J Maj USAF nd S m ns D G Maj USAF (MC) An mal ud f ub-gr y dur g ock fl gh J A ia Med 23 421 432 Oc 1952

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Mul h L J L C l USAF Eff f d osin 5 m ph pha m nd ortal l pid h k Am J Phy l 170 346 Aug 1952

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P k E K Cap USAF (MC) nd L d y S Icte us ut m lia y be losis Am R T be 66 77 85 July 1952

R dmond R F Cap USAF (MC) M l h L J Lt C l USAF nd Cath un W W Se d Lt USAF (MSC) *Eff f hype as ty ad* m l p pr A g l gy 5 408-412 Oc 1952

R g F B L (jg) M C USNR Ea ly m d l h l f N J y J M Soc N w J y 49 418-420 Oct 1952

S w l M A L MSC USN nd E A S HMC USN D m ns f nzyma f or Sch tos ma ma by p ococ l d p l J Inf D 91 191 197 1952

EFFECTIVENESS OF DDT IN THE CONTROL OF BODY LICE IN GERMANY[1]

RALPH W BUNN *Lieutenant Colonel MSC USA* [2]

RECENT reports of the failure of DDT to control the body louse effectively in Korea [3, 4] raised the question as to whether similar resistance to DDT existed in lice in Germany DDT powder has been used extensively in Germany in the past for control of lice and typhus fever with excellent results For example, the 820th Quartermaster Sterilization Company alone, in 1944 and 1945, dusted about 2 million persons, using over 37 tons of DDT in the process The question of whether or not the lice in Germany had developed resistance to DDT was important because thousands of pounds of 10-percent DDT powder are maintained in quartermaster depots for emergency use in the event of a typhus epidemic If this material could not be relied on for louse control, immediate steps would be necessary to find an effective substitute

EXPERIMENTAL PROCEDURE

Persons infested with body lice are rare in Germany today Field tests were therefore not practicable and it was necessary to rely entirely on laboratory tests Five strains of lice were collected from mid January to mid February, 1952 Four of these came from vagrants in the Frankfurt city jail The fifth strain was obtained in Berlin from a refugee from the East Zone of Germany through the co-operation of the German Red Cross In only one instance were sufficient lice obtained to conduct a test on the parent stock In all other cases, additional lice had to be reared in the laboratory before tests could be made Rearing was accomplished by keeping the lice on a circular swatch of wool Army uniform cloth 1 5 inches in diameter in a 50-ml beaker

(1) From the 4th Medical Field Laboratory Army European Command

(2) Now in the Preventive Medicine Division Office of the Surgeon General Department of the Army

(3) Eddy G W Report on effectiveness of certain insecticides against DDT-resistant body l in Korea Interim Report No 0-141 Bureau of Entomology and Plant Quarantine U S Department of Agriculture 1951

(4) Barnett H C and Knoblock E C. Chemical and biological studies on DDT resistance of lice U S Armed Forces M J 3 297 304 Feb 1952

placed in an incubator maintaining a temperature of about 85 F and a relative humidity of 60 percent The lice were fed twice daily on human blood The containers used for rearing and feeding are shown in figure 1



Figure 1 Laboratory technique of feeding body lice

Tests were conducted by treating a circular swatch of wool uniform cloth 1 5 inches in diameter with the desired quantity of standard 10-percent DDT powder (QM item 51 I 180) rubbing the material evenly onto both sides of the swatch The swatch was placed in the bottom of a 50-ml beaker and 20 adult or third instar nymphs were introduced The beakers were kept in an incubator at 85 F and 60 percent relative humidity The lice were given an opportunity to feed twice daily and mortality records were obtained 24 and 48 hours after the initial exposure

to the treated swatch I ice classified as living showed no notice able effect of the DDT and those affected but still capable of movement were classified as moribund In nearly all tests an equal number of male and female lice were used All controls showed negligible mortality Some initial tests were also made using the same type of powder packaged in a 2 oz rather than the 5 lb can The results with the 2 powders were similar Chemical analysis of these samples showed that the DDT content of both fulfilled the specifications

TABLE 1 *Mo tality of body lice in constant contact u ith DDT treated cloth using 20 lice per test and 5 tests with each stra n and rate of t eatment*

Louse strain	Number of lice used	After 24 hours (percent)			After 48 hours (percent)		
		Living	Moribund	Dead	Living	Moribund	Dead
Cloth treated with 27 mg of 10-percent DDT powder per sq in							
A	100	3	16	81	0	0	100
B	100	0	2	98	0	0	100
C	100	0	3	97	0	0	100
D	100	0	1	99	0	0	100
Cloth treated with 13 mg of 10-percent DDT powder per sq in							
A	100	5	4	91	0	0	100
B	100	5	4	91	1	0	99
C	100	2	2	96	0	0	100
D	100	2	2	96	0	0	100
E	*100*	*4*	*16*	*80*	*0*	*0*	*100*

MORTALITY TESTS

Initial tests were made as described above by applying DDT powder to the cloth swatches at a rate of 27 mg of the 10-percent DDT powder per square inch of cloth and leaving the lice in con tact with the cloth for the duration of the test This application rate is equivalent to more than 3 oz of powder for a complete uniform and is in excess of the application rates generally used Because all the lice were killed in the tests, the application rate was reduced to 13 mg per square inch in subsequent experi ments, the equivalent of about 1 5 oz per uniform The results of the tests are shown in table 1 The mortality of lice after 24 hours ranged from 81 to 99 percent with the heavy dosage and from 80 to 96 percent with the light dosage Out of 900 lice used in these tests only one louse that had been on a lightly treated swatch remained alive after 48 hours

A second series of experiments was designed to determine the length of time of contact with treated cloth required to kill all lice The lighter rate of application was used Lice were placed on a treated swatch as before but were then removed from the treated swatch after the desired time interval and held on an untreated cloth for the 24 and 48-hour observations The results are shown in table 2 These results show that lice must remain in contact with the treated cloth for nearly a full day before 100 percent mortality can be expected

TABLE 2 *Mortality of body lice after various periods of contact with DDT treated cloth using 20 lice each and a 13 mg per 10 per cent DDT powder mixture*

Extract	Length of exposure (hours)	After 24 hours (Percent)			After 48 hours (Percent)		
		Living	Moribund	Dead	Living	Moribund	Dead
B	7 5	80	10	10	80	0	20
B	9 5	40	15	45	40	0	60
B	16 0	10	0	90	5	0	95
A	17 0	25	5	70	20	0	80
A	18 0	35	5	60	30	0	70
B	20 0	0	0	100	0	0	100
B	20 0	0	0	100	0	0	100
C	20 0	10	15	75	5	0	95
D	22 0	0	5	95	0	0	100
B	22 5	5	0	95	5	0	95
A	23 0	0	0	100	0	0	100
B	23 0	0	5	95	0	0	100
C	23 0	0	10	90	0	0	100
D	23 0	0	0	100	0	0	100
E	23 0	0	0	100	0	0	100

A limited number of tests were made to determine the effectiveness of swatches at varying intervals after they had been treated Treated swatches were hung on open racks in the laboratory then tested after varying intervals as shown in table 3 Complete mortality at 48 hours was obtained in all tests except one with a 98 day old swatch In this test two lice were still capable of movement at the end of the 48 hour period

TABLE 3 *Mortal ty of body lice in constant contact with cloth treated with DDT at various periods prio to test, using 20 lice per test and cloth treated with 13 mg of 10-percent DDT powder per sq in.*

Louse strain	Age of swatch at time of test (days)	After 24 hours (Percent)			After 48 hours (Percent)		
		Living	Moribund	Dead	Living	Moribund	Dead
D	14	15	10	75	0	0	100
B	21	35	25	40	0	0	100
D	21	10	5	85	0	0	100
A	28	55	25	20	0	10	90
E	28	10	15	75	0	0	100

DISCUSSION

These tests indicate that the standard Army louse powder containing 10-percent DDT, applied at a rate of about 1 5 oz per uniform, will achieve satisfactory control of the body lice collected in Germany when the lice are in continuous contact with the treated cloth Lice must be in contact with the treated cloth for about 24 hours before a complete kill can be expected

Eddy *(3)* reported that in tests with normal laboratory lice at Orlando, Fla , powder containing only 0 1 percent usually caused 100 percent kills in 24 hours Although no comparable tests have been made to date with the German strains, it may be noted that 100-percent mortality was not obtained in these tests in 24 hours using the 10-percent powder There is some indication, therefore, that the German strains are somewhat more resistant to DDT than is the normal Orlando laboratory strain

SUMMARY

Laboratory tests on 5 strains of body lice collected in Germany indicate that the standard Army 10-percent DDT powder will achieve effective louse control There is evidence, however, that the louse strains tested are somewhat less susceptible to DDT than is the Orlando Laboratory strain

BOOK REVIEWS

Nerve Impulse Tr ct o of the Third Conf 3 nd 4 Ma ch 1952 N w Yo k N Y d t d by *H H to M tt* M. D P of or of N ology Coll g f Phys cia d Surge Col mbia Uni er ty N w York N Y *Spon d by th Josi h Ma y J F d t o* 176 pag ill str t d P t d by P ogr ss A iat I Caldwell N J 1952 P $3 50

The introduction to this book is by Doctor Fremont-Smith Medical Director of the Josiah Macy Jr Foundation who outlines the purpose of multiprofessional conferences such as the one here reported stating that in bringing together scientists from many fields of research it is hoped to promote meaningful *communication between scientific disciplines* Biochemical Similarities and Differences Between Synaptic Transmission and Axonal Conduction, Electrical Similarities and Differences Between Synaptic Transmission and Axonal Conduction and The Structure of Synaptic Junctions form the 3 chapters of the book, each chapter being a verbatim report of an informal round table discussion This is a scientific and erudite work The practicing physician must be well versed in the semantics of advanced *chemistry biophysics, and the like fully to comprehend these* discussions —*Lt Col J W Sumner MC USA*

Un t d State Army in World W II P ctorial R cord Th War Ag i st Japan *Off of th Ch f of M l t ry H st ry D p tme t of th A my* W h ngto D C 1952 471 page llustr ted P int d by U S Gov ment P *ti g Off e W h gton D C 1952*

This volume is divided into the following sections (1) The Allied Defensive (2) The Strategic Defensive and Tactical Offensive (3) The Offensive—1944 (4) The Final Phase (5) The China Burma India Theatre and (6) The Collapse of Japan and the End of the War in the Pacific Because it is a supplement to corresponding narrative volumes the text is brief consisting of a short introduction in each section outlining the major events which are depicted in detail by the well captioned photographs The pictures show the types of terrain equipment and weapons of friendly and enemy forces Episodes of human interest and the living conditions under which these operations were conducted are well illustrated The types of military operations with stre on amphibious warfare which prevailed in the Pacific are emphasized Used in conjunction with the corresponding narrative volumes this book is invaluable

—*Brig Gen C F Sams MC USA*

FATAL ANAPHYLACTIC REACTION FOLLOWING PENICILLIN INJECTION[1]

WILLIAM N CHRISTENSON *Lieutenant MC USNR*
GERALD W HEDRICK *Lieutenant junior grade MC USNR*
ROBERT F SCHUGMANN *Commander MC USN*

ANAPHYLACTIC reactions following the use of penicillin are the most dramatic of the several varieties of penicillin reactions that have been described, and their seriousness is demonstrated by the fact that of the 8 previously reported instances 3 have been fatal This report will describe a fourth such fatality which occurred in a patient without previous history of allergy and who had been given penicillin previously without reaction

O'Donovan and Klorfajn (2) produced an anaphylactoid state in a patient known to be penicillin sensitive by giving an intramuscular injection of 15,000 units of penicillin, this reaction was not fatal Wilensky (3) reported the first death from anaphylaxis following treatment with penicillin Waldbott (4) reported another Cormia et al (5) reported an anaphylactoid reaction following 20,000 units of penicillin. Burleson (6) described a case of anaphylactoid shock following the injection of 200,000 units of crystalline sodium penicillin G and 0 5 cc of 1 percent procaine The patient responded to immediate treatment with diphenhydramine given intravenously Everett (7) reported two nonfatal anaphylactic reactions which followed the intrasinus instillation of penicillin Thomson (8) described another fatal

(1) From U S N S. *General Alexander M. Patch.*

(2) O'Donovan W J and Klorfajn, I Sensitivity to penicillin anaphylaxis and desensitization. Lancet 2. 444 446 Sept 28 1946

(3) Wilensky A. O Fatal delayed anaphylactic shock after penicillin (Comment on Gordon article in letter to the Editor) J A M A 131 1184 Aug 17 1946

(4) Waldbott, G L. Anaphylactic death from penicillin J A M. A 139 526-527 Feb. 19 1949

(5) Cormia F E. Jacobs L. Y and Smith E L Reactions to penicillin. Bull U S. Army M. Dept 4 694 702 Dec 1945

(6) Burleson, R. J Anaphylactoid shock due to penicillin, report of case J A M. A. 142 562-563 Feb 25 1950

(7) Everett R. Anaphylactic reactions from local use of penicillin report of 2 cases J A. M. A. 146 1314 1315 Aug 4 1951

(8) Thomson, W O Sudden death following injection of penicillin. Brit. M. J 2 0 72 July 12 1952

anaphylactic reaction which followed the intramuscular injection of 300 000 units of crystalline penicillin G in a patient with a long history of penicillin therapy Two months previously this patient had sustained an anaphylactoid reaction after receivin procaine penicillin Because the previous reaction was attribute to the procaine portion of this mixture he was given crystallin penicillin in the latter instance An autopsy disclosed severa small petechial hemorrhages in the heart and lungs in additio to a number of chronic disease processes

A fourth fatal reaction recently occurred aboard the U S N S *General Alexander M Patch* during a transatlantic voyage

CASE REPORT

A 48 year-old Negro reported to the ship s hospital on 30 Ma 1952 complaining of a urethral discharge of 2 days duration Three smears were made on subsequent days each showin only a mixture of gram positive organisms, and a diagno is o nonspecific urethritis was made After the last smear, the patien was told to return on the following day for penicillin therapy At 1300 on 2 June he was given an intramuscular injection o 300 000 units of procaine penicillin G

Within 5 minutes he began to complain of generalized pruritus He became nauseated, vomited, and collapsed on the deck. A generalized tonic seizure followed, accompanied by urinary and fecal incontinence, after which he was unconscious and pulseless When seen by a medical officer about 5 minutes after the onset of the reaction he was unconscious and apneic his eyes were rolled upward his skin showed generalized rubor his reflexes were absent and his pulse and blood pressure were unobtainable An intravenous injection of 0 2 cc of 1 1,000 aqueous solution of epinephrine was given immediately followed by an intra muscular injection of 0 8 cc of this solution Irregular shallow respirations returned but, because the pulse and blood pressure remained unobtainable 0 5 cc of the solution was injected into his heart. Shortly after this a weak pulse of 120 beats per minute became palpable and the blood pressure rose to 60/40 but the patient remained comatose Further examination revealed diffuse musical wheezes and moist rales throughout all lung fields small but equal pupils which did not react to light generalized flaccidity without obtainable deep tendon reflexes and lack of any response to painful or other stimuli At no time were heart sounds audible

Treatment consisted of intramuscular injections of epinephrine ephedrine, and coramine and intravenous injections of calcium gluconate and aminophylline at varying intervals all without evident effect. Oxygen was supplied constantly by mask. There

was no change in the state of consciousness and there were no further convulsions The patient vomited from time to time, requiring frequent aspiration of the airway His blood pressure did not rise above 60/40 and his respirations remained shallow at a rate of 20 to 30 per minute He did not react to any stimuli, though he had a further episode of fecal incontinence 2 hours after the onset of the reaction The terminal portion of this discharge showed gross blood and the vomitus later presented the appearance of "engine oil "

The patient continued in this state for 5 hours To exclude the possibility of a cerebral hemorrhage, a lumbar puncture was performed This revealed an initial pressure of 200 mm cerebro spinal fluid, which was crystal clear and showed no cells on microscopic examination Fifteen minutes later the patient's respirations ceased and his pulse disappeared Repeated intra cardiac injections of epinephrine were without effect and he was pronounced dead 5½ hours after the onset of the reaction

An examination of the patient's previous medical records showed that in February he had been treated with penicillin ophthalmic ointment for conjunctivitis and that 1½ years previously he had received 3 injections of procaine penicillin in peanut oil There was no record of any untoward reaction to these medications No history of allergy could be obtained and a routine physical examination on 15 April had not demonstrated any abnormality

Autopsy report The heart, weighing 380 grams, appeared small for the size of the patient's body (estimated weight 210 pounds) Microscopic study revealed moderate congestive edema and acute myocardial degeneration. There was marked congestive hyperemia, mild edema, and partial atelectasis of both lungs The splenic pulp revealed focal areas of hyperemia with hemorrhage Edema of the pulp was prominent The appearance was that of mild toxic splenitis There was mild congestive edema and mild centrolobular toxic degeneration of the liver cells There was acute congestive hyperemia of the intestine with hemorrhage into the small and large bowel The kidneys presented acute interstitial edema Some proximal tubules revealed degeneration of the epithelium. Focal arteriosclerotic glomeruli were seen There was an acute right epididymitis There were one focus of edema and degeneration of the cortical cells of the adrenals There appeared to be acute congestive edema of the brain No evidence of cerebral hemorrhage was found

DISCUSSION

This is the first report of a sudden death occurring immediately after the injection of penicillin into a person who had

been previously treated with this antibiotic In each instance the clinical aspects of the reaction corresponded with the description of acute anaphylaxis, and in the present case this impression was borne out by the postmortem study which revealed evidence of generalized smooth muscle spasm extreme splanchnic congestion with hemorrhage, and areas of acute toxic degeneration in the internal organs Each fatal case, as well as those that did not die, had a history of previous treatment with penicillin One of the fatal cases had bronchial asthma *(4)*, but in Thomson s *(8)* and in the present case there was no history of asthma or other form of allergy It is apparent that either procaine penicillin or crystalline penicillin alone can elicit a fatal reaction In the present case it is interesting to note that each of the types of penicillin vehicle previously used i e , in oil and as a topical ointment, is considered to be a potent sensitizing agent for the development of hypersensitivity

With the extreme popularity of penicillin therapy the number of patients who will give a history of previous treatment with penicillin is constantly increasing Therefore, an increase in the number of anaphylactic reactions to this drug may be expected and indeed many physicians may have encountered instances of milder anaphylactoid reactions similar to the second one described in Everett s report *(7)* Careful history taking can prevent such an occurrence and this point is especially important because the second reaction may be fatal as in Thomson's patient *(8)* A negative allergic history does not insure against the occurrence of such a reaction, but in the presence of an allergic history the drug must be given with great caution

The experience of Burleson *(6)* indicates that the immediate intravenous injection of diphenhydramine may be of great value, and, if given rapidly enough, it might be lifesaving In the present case this drug was not available and epinephrine though of some benefit, failed to control the reaction adequately

WATER CHLORINATION

STANLEY J WEIDENKOPF *Lieutenant Colonel MSC USA (1)*

CHLORINE was first used as a routine disinfectant for public water supplies in 1908 when bleaching powder or hypochlorite was used to treat the water supply for Jersey City, N J The success of this project, plus the fact that the country was still in an era of major typhoid epidemics, resulted in a rapid acceptance of this method of water purification Epidemiologically, expectations were realized, and the transmission of typhoid and other enteric diseases through drinking water was sharply reduced The bacteriologist could verify the effectiveness of chlorination by counting bacteria before and after small amounts of chlorine were added to contaminated water and noting the reduction effected

The Army early recognized the value of chlorine as a water disinfecting agent and sponsored research and development in this field The first application of liquid chlorine to a water supply in this country was at Fort Myer, Va , by Major (later Brigadier General) C R Darnall, MC, USA Although the advances in water treatment methods and equipment at military posts paralleled those in civilian communities, the Army in the field had problems without civilian counterpart and proceeded to search for solutions to these important problems By 1918, Major William J Lyster, MC, *(2)* had designed a water sterilizing bag and developed a method for disinfecting its content by using chlorine in the form of calcium hypochlorite

The A E F in World War I established a policy that all water for troop consumption was to be considered of doubtful quality and to be purified unless found to be acceptable by a series of examinations and tests *(3)* To accomplish this purification, calcium hypochlorite was used in water sterilizing bags, chlorinating tanks, tank carts, tank trucks, and final drinking faucets water, a chlorine solution obtained from the French, was also used for these purposes Liquid chlorine was used by the base area semipermanent, water treatment plants and by the 9 hygiene

(1) Preventive Medicine Division, Office of the Surgeon General, Department of the Army

(2) Lyster W J Sterilization of drinking water by calcium hypochlorite in the field Mil. Surgeon 36: 222 1915

(3) Leland M. W., and Wolf A. P. Water supply of the American Forces in the World War VI Sanitation of Camps and Stations Washington, D C 1926 pp 223-268

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Since World War I water purification has advanced to a recognized scientific specialty There have been 3 definite periods in the development of the science of water chlorination

1 The first period followed introduction of the chlorine in 1908 During this period it was generally thought that some constant, fixed amount of chlorine could be used to sterilize any and all water Research at that time was directed toward determining what that *universal dosage* should be

2 The second period was one in which it was recognized that waters varied in composition and required varying amounts of chlorine It was then thought that it was the chlorine residual rather than the dose that was important and all research was directed toward finding some *universal residual* that would guarantee a safe drinking water

3 The present period is one in which it is still recognized that a residual is necessary but that in addition it is also necessary to know the *form of the chlorine in the residual* before it is possible to predict the efficiency of the purification process

THEORY OF CHLORINATION

The present concept of the chlorination of natural waters is that chlorine remains in the water as molecular chlorine for only a very short time and then combines with (1) inorganic reducing substances, (2) ammonia and amines (3) organic substances other than amines and (4) water to form various compounds

An understanding of the mechanism of these reactions is essential to predicting the success of chlorination

The combination of chlorine with inorganic reducing substances The most frequently encountered reducing substances are ferrous iron manganous manganese nitrites, and hydrogen sulfide In accordance with the chemical laws these substances react with chlorine much more rapidly than organic substances The chlorine going into these reactions loses its bactericidal action completely Enough chlorine must be supplied to complete these reactions before disinfection can be accomplished

The combination of chlorine with ammonia and amines Ammonia and amines are frequently present in natural waters and react

readily with hypochlorous acid to form monochloramine (NH_2Cl), dichloramine ($NHCl_2$), or nitrogen trichloride (NCl_3) *(4)* This is probably a step reaction as represented by the following equations

$$NH_3 + HOCl \longrightarrow NH_2Cl + H_2O$$

$$NH_2Cl + HOCl \longrightarrow NHCl_2 + H_2O$$

$$NHCl_2 + HOCl \longrightarrow NCl_3 + H_2O$$

The disinfecting action of chlorine is modified by its change to chloramine but in this form the chlorine continues to destroy bacteria The principal factors affecting the effectiveness of the chloramines are (1) the pH of the solution, (2) the temperature of the solution, and (3) the concentration of chloramines *(5)*

The pH of the solution has an important influence on the bactericidal activity of the chloramine With an increase in pH, there is a corresponding decrease in the bactericidal action of the solution This is explained on the basis of the relative amounts of dichloramine and monochloramine in the solution, the dichloramine (formed at lower pH values) being the more effective disinfectant and therefore the more desirable of the two chloramines *(4)* Also, the presence of an excess of ammonia affects the formation of the desirable dichloramine With a chlorine to ammonia weight ratio of 5 1, the following may be expected

pH	*Percent of chlorine as dichloramine*
5	84
6	62
7	35
8	15
9	6

The temperature of the chloramine solution also affects the bactericidal action A general rule was found to be that a reduction of 20 C (from about 23 C to about 3 C) necessitated 9 times as long a period of contact or 2 5 times as much chloramine to produce a complete kill of bacteria

(4) Fair G M New concept of water chlorination. Eng News Rec 141 60 1948
(5) Butterfield C. T., and Wattie E Influence of pH and temperature on survival of coliforms and enteric pathogens when exposed to chloramine Pub Health Rep 61 157 192 Feb 8 1946

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The bactericidal efficiency of free available chlorine is determined by the pH of the solution, the contact time, and the temperature The pH of the solution determines the relative amount of the chlorine which will be in the form of HOCl The longer the contact time of the HOCl with the bacteria, the greater the resultant kill In pH ranges between 7 and 8 5, the bactericidal properties of free chlorine are not affected by low temperatures (7) At higher pH values, the activity is retarded by lowering the temperature

TABLE 1 *Percent of free available chlorine as*

pH	Molecular chlorine	Hypochlorous acid	Hypochlorite ion
4	0 5	99 5	0
5	0	99 5	0 5
6	0	96 5	3 5
7	0	72 5	27 5
8	0	21 5	78 5
9	0	1 0	99 0
10	0	0 1	99 9

BREAK POINT CHLORINATION

Break point chlorination is the process which takes full advantage of the present knowledge about the mode and action of chlorine when it is introduced into natural waters It requires the addition of a sufficient quantity of chlorine to meet all the demands of the water (stabilize certain organic and inorganic substances) and still leave a residual of free available chlorine Break point chlorination controls both the amount of the residual chlorine and, more important, the nature or form of that chlorine The older processes controlled only the amount of the residual chlorine

The advantages which can be expected from the break point process and the resulting free available chlorine are (1) a quick and reliable killing of bacteria, (2) reduction in tastes and odors resulting from organic materials present in the water, (3) bleaching of color in the water, (4) oxidation of certain organic and inorganic substances and (5) prevention of biologic growths in the filter plant and distribution system

The only disadvantage is a slightly higher chlorine consumption. Some water may require less than 1 p p m to produce free re-

(7) Butterfield C T Bactericidal properties of free and combined available chlorine J Am Water Works Assoc 40 1305 1948

sidual chlorine other water may require from 15 to 90 p p m In one case on record 110 p p m was required

Break point chlorination is normally the method of choice for both garrison and field treatment. This process should always be used when it is necessary to have safe water quickly and when the water may become recontaminated The chloramine process may be used when there is a long contact period before the water is used and when there is no possibility of recontamination The two processes may be combined by employing break point chlorination at the treatment plant and chloramines in the distribution system

TESTING FOR RESIDUAL CHLORINE

The tests most commonly used in the field to measure chlorine in water are (1) the standard orthotolidine test, (2) the orthotolidine flash test and (3) the orthotolidine arsenite test.

The standard orthotolidine test, made by adding orthotolidine to water and waiting 5 minutes, measures the total chlorine residual in the water but it does not differentiate between free available chlorine and chloramines Its accuracy may be affected by the presence of certain interfering oxidizing agents The effect of these interfering substances is to develop additional color above that resulting from the chlorine

The orthotolidine flash test may be used to obtain a qualitative determination of the presence of free available chlorine *(8)* Free available chlorine reacts almost instantly with orthotolidine but chloramines react relatively slowly This difference is especially noticeable at temperatures below 60 F It follows that the reading obtained about 5 seconds after the addition of orthotolidine will approximate the amount of free available chlorine in the water and the reading taken after 5 minutes will give the total available chlorine in the water The difference between these readings will be the amount of combined available chlorine (chloramines) in the water

The orthotolidine arsenite test measures the relative amounts of free available chlorine and combined available chlorine It also corrects false color reactions due to interfering substances in the water It is the most accurate and dependable of the field tests and is the test of choice if free available chlorine is to be measured or if it is suspected that interfering substances are present. It is slightly more complicated than the standard orthotolidine test involving two reagents (orthotolidine and sodium arsenite)

(8) L P C B k p bl And J Am W t W ks As 32 1207 1940

A new Medical Service water testing kit that can be used for performing all of these tests, as well as determining pH and residual chlorine levels from 0 to 250 p p m , has been standardized and should be in supply channels in 1953

THE ACTION OF CHLORINE ON BACTERIA CELLS (9)

It is reasoned that because chlorine is effective at only trace levels, it must inhibit some key enzymatic process within the cell *This was determined to be the oxidation of glucose by the* cell Once this power is lost, the cell dies Chlorine probably stops the action of triosephosphoric dehydrogenase, an enzyme that catalyzes an oxidation reaction essential to the utilization of glucose The fact that iodine seems to act on some other essential enzyme may explain its greater cysticidal power When enzymes are removed from cells, they are equally susceptible to destruction by a number of other oxidizing agents, including hydrogen peroxide and potassium permanganate, which are known to be inferior disinfectants This indicates that the cell walls are important factors in preventing entrance of these materials into the cells The rate of action of these agents is in direct proportion to their rate of penetration through cell walls HOCl is a superior disinfectant, not merely because of its strong oxidizing power, but because its small molecular size and neutral electrical charge enable it to penetrate cell walls quickly

HOW MUCH CHLORINE IS NECESSARY

It is believed that sufficient information is now available to enable one to predict with reasonable accuracy whether bacteria will be killed under a given set of conditions At the large municipal water treatment plants in the United States this is routinely accomplished with good results The water usually comes from large, well developed sources and varies only slightly in composition from season to season The treatment processes are based on frequent laboratory analyses and are controlled by scientific instruments and skilled operators Distribution of water to the consumer is through a complex system of pipes When the distribution system has been properly designed and installed and a continuous positive pressure is maintained, a high degree of protection is provided for the water

Water supplies at military posts approximate municipal supplies in design and operation but lack the stability characteristic of a municipal system Camps are built, enlarged, altered, and reduced Each change in the distribution system, the water treatment plant, or the plumbing within a building introduces possi

(9) Ge e D E , d Stumpf F K Mod of a t n of chl e e J Am W r Works Assoc 38 1 0 1946

bilities of contamination Therefore, a higher residual chlorine level is required at military posts than in most cities

Conditions in the field are different than in a garrison. Water is taken from the best sources available and is then cleaned and made safe to drink Water points are moved as the unit advances and the characteristics of the raw water from a single stream may change from hour to hour It is not practical to study, analyze and plan for scientific treatment at each water point. Therefore blanket requirements are established to guarantee safe drinking water under the expected conditions

The principal factors taken into consideration in establishing a chlorine residual for field units operating in a specific area and using a wide variety of water sources are

1 The species and concentration of pathogenic organisms likely to be encountered The concentration of chlorine required to inactivate or kill bacteria varies from species to species The cysts spores and some of the viruses are the most resistant and require the highest levels Highly contaminated water demands a higher concentration of chlorine than relatively safe water

2 The pH of the water and the amount of ammonia present These two factors determine whether the final form of the chlorine compound is free available chlorine or chloramine This in turn determines bactericidal efficiency

3 The amount and nature of organic material present in water Water containing large amounts of organic material requires greater amounts of chlorine Unoxidized organic material combines with chlorine Organisms buried in particles may be shielded from the bactericidal action of chlorine Water that is relatively free of organic material or that has been treated by coagulation sedimentation, and filtration can be rendered safe with lower concentrations of chlorine than water which contains much organic material

4 The temperature of the water The action of chlorine in cold water is much slower than in warm water With cold water either a higher level or longer contact time is required to produce the desired result. With the combination of low temperature, high pH and chloramines as a disinfecting agent the bactericidal action will be very slow

5 Contact time It requires time for chlorine to pass through the bacterial cell walls and kill the cell With high concentrations of chlorine this is accomplished quickly and vice versa In the Army the contact time is usually accepted as 30 minutes and the residual chlorine adjusted accordingly

6 Probability of recontamination after treatment. Water susceptible to recontamination should contain sufficient chlorine to kill bacteria quickly, right up to the time the water is consumed

7 Factors of safety After all other factors are evaluated, a factor of safety is added to compensate for incompleteness of scientific knowledge, unusual conditions, variations in equipment and supplies, human errors, errors in treatment, and accidental recontamination.

BOOK REVIEWS

Ophthalmic Plastic Surgery by *Stanley A Fox* M S (Ophth) M D F A C S Assistant Clinical Professor of Ophthalmology New York University Post Graduate Medical School Attending Ophthalmologist Goldwater Memorial and Bronx Veterans Administration Hospitals Associate Ophthalmologist Hospital for Joint Diseases Assistant Surgeon Ophthalmologist Bellevue Hospital New York N Y 290 pages illustrated Grune & Stratton Inc New York N Y publishers 1952 Price $15

This book is not intended to be an encyclopedia of plastic surgery, but rather a careful explanation of procedures which the author has used and found valuable Insofar as possible explanation is by illustration rather than by written text In this respect the book is outstanding A typical illustration has a photograph of a patient's eyes at the top of the page, then 6 or 8 drawings showing clearly each step in the surgical procedure used in its correction At the bottom of the page another photograph shows the result obtained These illustrations are unusually well done and could be followed quite easily by an experienced ophthalmologist If more than one procedure is described for a condition, complete illustrations are provided for each procedure and the factors to be considered in the selection of each are given

The field of ophthalmic plastic surgery as performed by the practicing ophthalmologist is well covered The book includes a brief but adequate review of the fundamentals of plastic surgery, including the anatomy of the brow and lids, fundamentals of operations on the lids, a discussion of skin and mucosal grafts and technical surgical details This is followed by discussions of canthoplasty repair of the epicanthus, conditions involving

the lid margins canthal repairs operations for entropion, ectropion ptosis, and displacements of the lid and globe reconstruction of the conjunctiva socket and upper and lower lids and the use of hair bearing grafts

Errors are bound to creep into a book of this type Several of the illustrations have very minor defects in the outlining of the undermined areas or in suture placement They are however remarkably scarce for a book so profusely illustrated The described technic of nerve block of the lids is not adequate The ophthalmic surgeon experienced enough to undertake plastic procedures will already have this information or should get it from another source

The book is written in direct very readable style with occasional smile provoking remarks which serve to hold the interest of the reader It is highly recommended to the ophthalmologist as a reference on ophthalmic plastic procedures

—Col V A Byrnes USAF (MC)

Methods in Medical Research Governing B rd *Irv e H Page* Ch irm n *A. C. Ivy C l n M. MacLeod, Carl F Schmidt E g n A Ste d, David L Thoms n.* V lume V *A C C cor* Ed to Chief Method fo Separati n of Complex Mixtures d Highe Molecular Weight Substan es *Lyman C. Cr g* Editor Method f R al Study *A C Co o a* Editor Imm nochem c l M thods of Determ ing Homog neity of Prote ns nd Polys ccharide *M lvin Cob* Ed ro 394 pages ill str ted The Ye r Bo k Publ h rs Inc Ch c go Ill 1952 Pr ce $7 50

The book is divided into 3 sections The first describes the methods for separating complex mixtures and higher weight molecular weight substances Complete information on counter current distribution, paper chromatography, electrophoresis and ultracentrifugation is given Section 2 gives a broad coverage to applied and experimental methods for renal study Section 3 discusses the modern methods for immunochemical characterization of proteins and polysaccharides, the production of antibodies in experimental animals the separation of the antibody active proteins from animal serums and the technic for analyses of quantitative precipitation reactions

These sections are self contained and complete The scientist interested in one or more of the above areas will find most satisfactory coverage of the methods and technics applicable In addition to this there is a critical appraisal of the limitations inherent in the technics and a description of recent modifications All of this should aid the investigator to be as critical of his experimental methods as he traditionally has been in appraising the results or conclusions made possible by use of these experimental methods *—Lt Col F L Bauer MC USA*

HERETOFORE UNDESCRIBED ORGANISM ISOLATED FROM THE GENITOURINARY SYSTEM[1] [2]

SIDNEY LEOPOLD *Captain MSC, USAR* [3]

WHAT appears to be a new bacterium has been repeatedly isolated from the human genitourinary tract It was primarily isolated only on the modified type of blood agar medium described by Casman [4] After extensive studies with other dehydrated blood agar bases, this laboratory selected Casman's medium for use in the examination of all specimens submitted for bacteriologic study in which blood was a growth requirement Samples of urine and cervical smears streaked on this medium and incubated in a 10 percent carbon dioxide atmosphere frequently yielded the organism herein described. It was isolated in pure culture from many specimens, and whenever encountered was the predominating organism In the 2 years previous to the adoption of Casman s medium this organism was not encountered

Methods Urine samples were collected aseptically from men after swabbing the urinary meatus with alcohol After centrifugation, the sediments obtained were streaked onto Casman's medium Specimens taken by swab from the cervical os were smeared directly onto the same medium The inoculated plates were incubated at 37 C under 10 percent carbon dioxide for 48 hours Following primary isolation, the organism can be maintained by serial culture in thioglycollate broth

Description of the organism The organism is a gram negative, nonmotile, nonencapsulated, pleomorphic rod 0 5 micron wide and from 0 5 to 2 micra long (fig 1) It appears as a tiny, pinpoint, colorless, definitely hemolytic colony on Casman's blood

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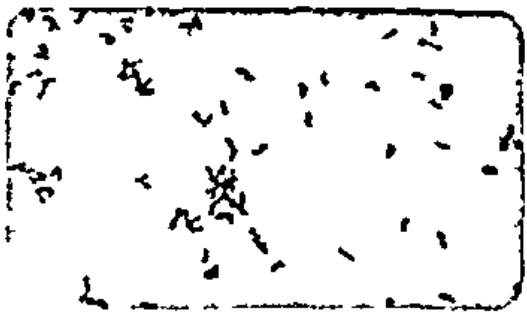
(1) Presented at the meeting of the Allegheny Branch of the Society of American Bacteriologists Pennsylvania State College October 1948

(2) Reviewed by the Veterans Administration and published with the approval of the Acting Chief Medical Director The statements and conclusions published by the authors are the result of his own study and do not necessarily reflect the opinion of the Veterans Administration

(3) Veterans Administration Hospital Martinsburg W Va at time of writing now at Camp Detrick Md

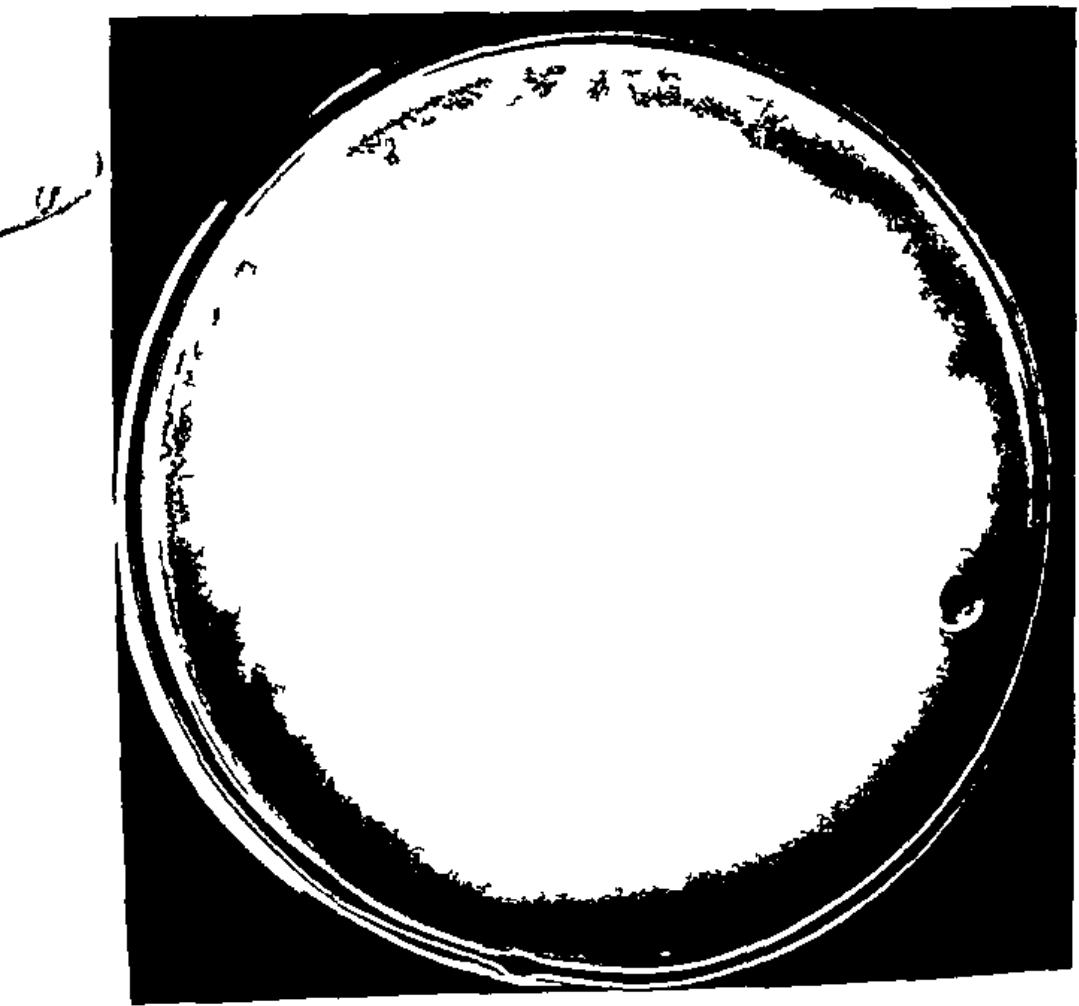
(4) Casman E P New infusion blood agar base for Neisseria pneumococci and streptococci Am J Clin Path 17 281 289 Apr 1947

agar after 48 hours incubation (fig 2) Although the colony is not visible to the naked eye after 24 hours of incubation it may be detected at this time by an area of slight hemolysis surrounding it. The colonies may attain a diameter of 0 5 mm after several transfers Subculture in thioglycollate broth requires, as



F g 1 Phot microg aph f p cult of o gan sm X 900

a rule a heavy inoculum and 48 hours of incubation The growth is micro aerophilic and markedly diminished when methylene blue is employed instead of resazurine as the eH indicator (fig 3) In this medium the organism remains viable for from



F g 2. Plate hou g 48-hou growth of hem lyt c col s

5 to 7 days at 37 C Colonies on blood plates usually must be transferred at the end of 48 hours to maintain viability and will not survive even a 1 day shipment in the mails on this medium As a base for the determination of fermentation we employed cysteine trypticase agar *(5)* Acid is produced in glucose, maltose, and dextrin, and some strains show slight acid reaction in xylose and arabinose Sucrose, lactose, inulin, mannitol, and

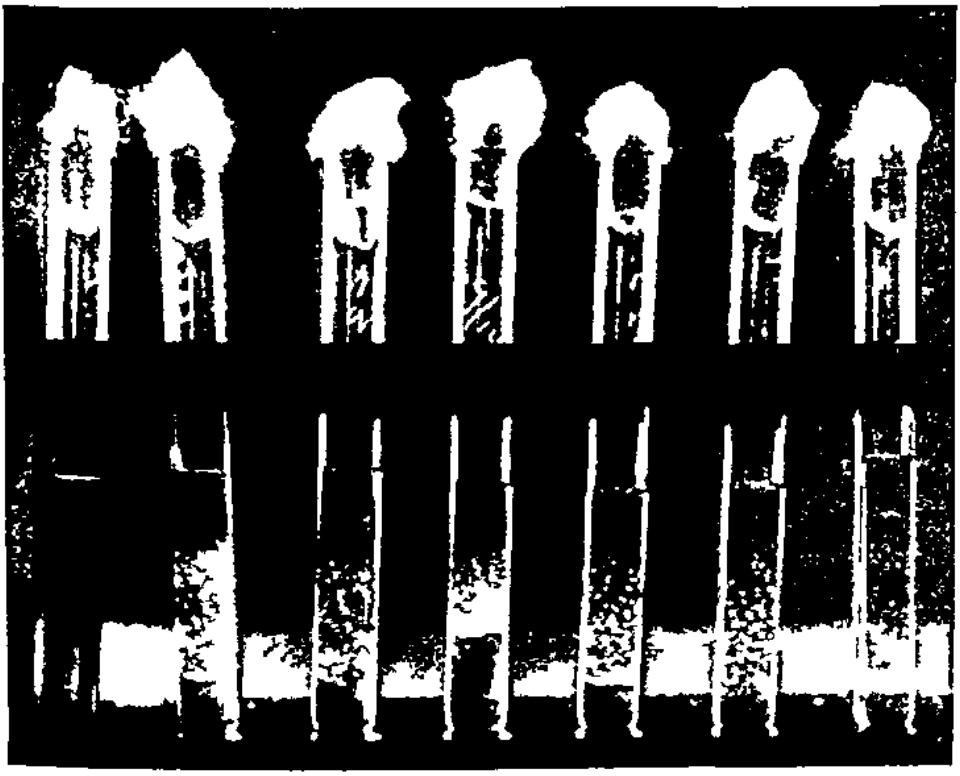


Figure 3 Growth in thioglycollate after 3 to 5 days (eH indicator resazurin)

glycerin are not fermented The organism does not reduce nitrates and is oxidase-negative with p-aminodimethylaniline monohydrochloride

Association with clinical symptoms All men from whom this organism was isolated showed signs of mild to moderate prostatitis, with or without urethritis In many, the prostatitis was detected by physical examination after the laboratory reported the presence of the organism in the urine specimen The women from whom this organism was isolated exhibited signs of cervicitis, with or without erosion Some showed signs of the usual postpartum cervicitis in which no definite symptoms of infectious cervicitis were experienced This organism has not been isolated from 134 cultures of the upper genitourinary tract Although the organism has been isolated from bladder specimens taken during cystoscopy it has never been found in specimens

(5) [illegible] H D Simplified medium for identification and maintenance of gonococcus and other bacteria J Bact 55 531 536 Apr 1948

taken directly from the right and left ureters The extent to which the organism was encountered is shown in table 1. The largest number of specimens consisted of routine unselected urines received for bacteriologic examination, but did not include specimens examined after the initiation of therapy The high percent of positive cultures isolated from the cervix and from the husbands of women with positive cultures seems especially significant First morning specimens might have resulted in an even higher percent of positive cultures in the last group

TABLE 1 *Frequency of occurrence of the organism in genitourinary cultures*

Type of specimen	Total number of cultures	Positive cultures	
		Number	Percent
Urine (from men)	965	53	5 5
Urine from men with previous histories of nonspecific urethritis	18	2	11 1
Cervical swab	58	16	27 4
Urine from husbands of women in series 3 with positive cultures	9	4	44 5
Total	1 050	75	7 2

1 Excluding specimens from urinary catheterization

DISCUSSION

These data are presented for consideration of the possible role of the organism described in infections of the lower genitourinary tract A description of the organism has not been found as yet in the literature and identification must await more extensive study of growth requirements, cultural characteristics antigenic structure and pathogenicity Certain characteristic such as growth requirements and microscopic and macroscopic morphology suggest a close relationship to the genus Hemophilus but contraindicate inclusion in the Mimeae *(6 7)* tribe To date, attempts to identify this organism with the pleuropneumonia group by the use of specialized media have been unsuccessful

(6) DeBord G G Description of Mimeae with the genera and the proposed species of Neisseria from the genitourinary tract and vagina J State Coll ge J Sc 16 471 480 1942.

(7) DeBord G G Specific tribe Mimeae Neisseria and Streptococcus bacteriologic diagnosis by mass J Lab & Clin Med 28 710-714 May 1943

MEDICAL PROCESSING OF A NATIONAL GUARD INFANTRY DIVISION[1]

ANTHONY RUPPERSBERG Jr *Colonel MC, NGUS (Ohio)* [2]

COLLINS WIGHT *Lieutenant Colonel MSC, USA* [3]

WITHIN the scope of medicomilitary literature, and within the files of various headquarters in the higher echelons, there is a distinct paucity of details concerning the medical processing of a unit of the civilian components for induction into Federal Service Recently, we supervised and directed administrative measures and professional reviewing of preinduction physical examinations executed on members of the 37th Infantry Division, Ohio National Guard We believe that a pattern for processing units for extended active duty might prove valuable We will, therefore, (1) present an organizational program for Army Medical Service officers who may, in the future, be called on to process a large unit of a civilian component for induction into Federal Service, (2) point out the problems encountered during the processing of the 37th Infantry Division Ohio National Guard, 1951 1952 and (3) present statistics for comparison with those of similar units

One of us (AR) served as a member of an examining board when the Division was mobilizedon 15 October 1940 Unlike the recent program, the plan 12 years ago called for the medical processing to begin on the induction date The establishment of preinduction processing constitutes a great improvement.

Numerous changes have also been made in the regulations pertaining to physical standards since 1940 One of the principal improvements was the establishment of the physical profile (PULHES) system, the merits of which appear to both medical and line officers only after using it for a time

In an effort to obviate many common problems before they appeared numerous conferences were held with experienced offi-

(1) Presented at the Second Army Surgeon's Annual Orientation Conference for Army Medical Service Officers Cleveland Ohio 15 March 1952 and Cincinnati Ohio 16 March 1952

(2) Chief Surgeon Ohio National Guard

(3) Formerly Chief Medical Section Ohio Military Reservation

cers of various branches of the service We also conducted informal interviews with key persons in various offices of Ohio Military District and the Adjutant General s Department (Ohio) to elicit facts and opinions which would aid in the planning We hoped that accomplishment of the task would transplant persons as smoothly as possible from their homes and their civilian occupations into a military environment On the other hand, we knew in advance that individual resentment against an active-duty assignment on the part of certain guardsmen would occasionally result in malingering and the use of political pressure in their behalf

PLANNING

We first made an estimate of the situation which gave us the following information

1 Total number of National Guardsmen to be examined 7 133 (from the morning report AG Ohio, 1 September 1951)

2 Time allotted 18 weeks (from 12 September 1951, the date of the alert to 15 January 1952, the date of induction) The arbitrary deadline for completion of physical examinations was 15 December 1951 and the arbitrary deadline for completion of the typewritten report was 15 January 1952

3 Examinations would be performed in the towns where National Guard units were located This would preclude unnecessary travel of personnel from their homes and would eliminate the messing and billeting problem which would be created by ordering large groups to a central location

4 *Administration*

a In April 1951 twelve teams of medical and dental Reserve officers had been organized throughout the State for the purpose of conducting physical examinations on all Reservists under the Army Service Evaluation Program for Reserve personnel The location of these teams corresponded to the Ohio Organized Reserve Corps (ORC) centers with the exception of the Zanesville Center which was covered by the Columbus Center team These existing teams would be augmented with National Guard medical and dental officers and civilian physicians Table 1 shows the location of these teams and the number examined Fortunately SR 140-210-10 provided the authority to place Peserve and National Guard medical and dental officers on active duty on a daily basis Civilian physicians to assist with the examinations consultants, hospitals, and laboratories would be paid under the provisions of DA Circular 62 1952

b A chart listing the location, officer, warrant officer, and enlisted strength of all components of the 37th Division would be published by the Ohio National Guard headquarters The chart would indicate which officer in charge in each ORC center was responsible for the medical processing of each unit Columns were totaled to show the number of examinations to be accomplished by each center The Adjutant General of Ohio would be furnished sufficient copies of the chart for all components of the Division Distribution also would be made to officers in charge, ORC centers This chart was used by the medical section as a quick method of checking requisitions from ORC centers for medical supplies to see if amounts requested were justified by the total number to be examined

c ORC centers would furnish invaluable administrative assistance in co-ordinating and executing movement details

d Headquarters, Ohio-Kentucky Recruiting District would offer the use of the examining facilities in Toledo, Cleveland, Columbus, and Cincinnati, Ohio

e The Medical Section, Headquarters, Ohio Military District, Fort Hayes, Columbus, Ohio, would serve as a central co-ordinating agency and would review the physical profiles and type all forms Officers in charge, ORC centers would forward single copies, prepared in ink, of Report of Medical Examination (Standard Form 88) and Report of Medical History (Standard Form 89) Headquarters, Ohio Military District, would type required copies and return to officers in charge, ORC centers for signatures of medical and dental officers Officers in charge would turn completed forms over to unit commanders for distribution under the provisions of SR 130-10-1, "National Guard, Ordered into Active Military Service of the United States, 14 August 1951 "

MODUS OPERANDI

Processing procedures Plans completed, the processing of the examinees was set into operation The project began on 20 September 1951 and continued through 22 January 1952. All the medical examinations were accomplished by the respective examining teams The physical standards prescribed by AR 40 115 ("Physical Standards and Physical Profiling for Enlistment and Induction, 1948) were used in the processing of enlisted men and those prescribed by AR 40 105 ("Standards of Physical Examination for Commission or Warrant in Regular Army National Guard of the United States Army of the United States, and Organized Reserve Corps," 1948, and changes 1 and 2 1951) were used in the processing of officers

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a In April 1951 twelve teams of medical and dental Reserve officers had been organized throughout the State for the purpose of conducting physical examinations on all Reservists under the Army Service Evaluation Program for Reserve personnel The location of these teams corresponded to the Ohio Organized Reserve Corps (ORC) centers with the exception of the Zanesville Center which was covered by the Columbus Center team These existing teams would be augmented with National Guard medical and dental officers and civilian physicians Table 1 shows the location of these teams and the number examined Fortunately SR 140-210 10 provided the authority to place Peserve and National Guard medical and dental officers on active duty on a daily basis Civilian physicians to assist with the examinations, consultants hospitals and laboratories would be paid under the provisions of DA Circular 62, 1950

b A chart listing the location, officer, warrant officer, and enlisted strength of all components of the 37th Division would be published by the Ohio National Guard headquarters The chart would indicate which officer in charge in each ORC center was responsible for the medical processing of each unit Columns were totaled to show the number of examinations to be accomplished by each center The Adjutant General of Ohio would be furnished sufficient copies of the chart for all components of the Division Distribution also would be made to officers in charge, ORC centers This chart was used by the medical section as a quick method of checking requisitions from ORC centers for medical supplies to see if amounts requested were justified by the total number to be examined

c ORC centers would furnish invaluable administrative assistance in co ordinating and executing movement details

d Headquarters, Ohio-Kentucky Recruiting District would offer the use of the examining facilities in Toledo, Cleveland, Columbus, and Cincinnati, Ohio

e The Medical Section, Headquarters, Ohio Military District, Fort Hayes, Columbus, Ohio, would serve as a central co-ordinating agency and would review the physical profiles and type all forms Officers in charge, ORC centers would forward single copies, prepared in ink, of Report of Medical Examination (Standard Form 88) and Report of Medical History (Standard Form 89) Headquarters, Ohio Military District, would type required copies and return to officers in charge, ORC centers for signatures of medical and dental officers Officers in charge would turn completed forms over to unit commanders for distribution under the provisions of SR 130-10 1, "National Guard, Ordered into Active Military Service of the United States, 14 August 1951 "

MODUS OPERANDI

Processing procedures Plans completed, the processing of the examinees was set into operation The project began on 20 September 1951 and continued through 22 January 1952 All the medical examinations were accomplished by the respective examining teams The physical standards prescribed by AR 40 115 (Physical Standards and Physical Profiling for Enlistment and Induction, 1948) were used in the processing of enlisted men and those prescribed by AR 40 105 (Standards of Physical Examination for Commission or Warrant in Regular Army, National Guard of the United States, Army of the United States and Organized Reserve Corps," 1948 and changes 1 and 2 1951) were used in the processing of officers

Following the general medical processing procedures each examinee was required to fill out his own Report of Medical History (Standard Form 89) which was reviewed by the physician performing the examination and commented on by him when indicated

The medical findings with respect to each examinee were reported on the Report of Medical Examination (Standard Form 88) used as a medical work sheet Standard Form 88 and Standard Form 89 were forwarded on completion of the examination to the Medical Section Ohio Military District Headquarters where they were reviewed by a Medical Service Corps officer for completeness and then by a board of 3 medical officers

A large number of these forms were returned after review to the local examining teams for re evaluation of the medical findings or because of incomplete recording This procedure was definitely time consuming, but unavoidable About half of this number were returned because such defects as missing toes or fingers, appendectomies, et cetera, which had been reported by the examinees were not accounted for by the examining physician on the Standard Form 88 In other instances the medical personnel had failed to comment in their summaries of Standard Form 89 on pertinent defects such as positive answers by the examinee to homosexual tendencies drug addiction history of suicide et etera Among the forms returned were also those with borderline findings requiring consultation with a pecialist before a determination of acceptability could be made The number of examinations consultations, and forms returned are shown in table 1

As indicated in the table 1 520 consultations were accomplished either at the time of initial examination or after the forms had been returned by the medical section to the examining teams for further evaluation The examining teams which accomplished proportionally larger numbers of consultations prior to the initial forwarding of the examination forms to the medical section had relatively fewer forms returned for re evaluation

After the returned forms were reviewed by the examining teams they were sent back to the medical section for a final determination of physical fitness The forms of persons whose fitness was still regarded by the medical section as borderline because of minor defects were forwarded to the Surgeon Second Army for waiver In some instances the defects were of such a nature that the Second Army forwarded the forms to the Department of the Army for final action This was time consuming but proved very effective in that an examinee accepted on a waiver might be reasonably sure of being considered physically qualified for promotion et cetera at a later date Of the 860 examinees (1° percent

TABLE 1 *Number of examinations consultations and examination forms returned*

Location of examining team	Number			Percent	
	Examination	Consultations	Forms returned	Consultations	Forms returned
Akron	442	25	65	5 7	14 7
Canton	250	55	60	22 0	24 0
Cincinnati	1 183	263	246	22 2	20 8
Cleveland	1 473	134	121	9 1	8 2
Columbus	986	242	25	24 5	2 5
Dayton	685	84	119	12 3	17 4
Lima	787	193	175	24 5	22 2
Mansfield	311	57	42	18 3	13 5
Portsmouth	29	12	10	41 4	34 5
Steubenville	37		22		59 5
Toledo	959	408	102	42 5	10 6
Youngstown	253	47	18	18 6	7 1
Total	7 395	1 520	1 005	20 6	13 6

Of the t t l 7 329 e amin es 66 pers ns w re xamin d twic

of the total number) who were granted waivers 724 were overweight, 105 were underweight and 51 had other defects

Preparation and routing of the medical forms After final determination was made by the medical section with respect to the examinee s acceptability, Standard Forms 88 were ready for typing In the case of qualified examinees, an original and 9 carbon copies were typed All typed copies of Standard Form 88 and the single copy of Standard Form 89 were returned through the respective officer in charge ORC to the examining teams for signature After the forms were signed, they were forwarded through the officer in charge ORC to the unit commanders for distribution as follows The original of Standard Form 88 and Standard Form 89 to the unit file 1 copy to the Adjutant General Ohio and 1 copy to the Adjutant General U S Army In the case of disqualified examinees an additional copy of Standard Form 88 was prepared, which was given to the examinee This procedure was also followed with respect to examinees requiring waivers because it obviated the necessity of preparing a true copy in the event the waiver was not granted

The initial routing of the typed forms in case of disqualified examinees was the same as for qualified personnel but the signed forms received by the officer in charge ORC were forwarded to the Adjutant General Ohio, for final distribution because this headquarters published the discharge orders on men separated from the Division prior to the date of federalization The Adjutant General Ohio, forwarded in turn the original Standard Forms 88 and 89 to the Adjutant General U S Army and 9 copies to the unit commander (1 for the unit file and 1 for the examinee) One copy of Standard Form 88 remained in the file of the Adjutant General Ohio In all cases the medical work sheet (Standard Form 88) were retained by the medical section

Personnel involved The huge proportions of the prospective operation were revealed soon after the processing began A total of 478 persons contributed 1 day or more of work toward the completion of the task (table 2) Of the personnel involved in the project throughout the State 314 (65 7 percent) were physicians or dentists and 164 (34 3 percent) were administrative personnel As of 14 January 1952, 7 395 medical examinations and 1 590 consultations had been accomplished 95 medical examinations were performed after 14 January 1952 bringing the total to 9,010 medical examinations and consultations

Administrative activity of the medical section During the first 2 months of processing this office first concentrated primarily on reviewing the physical examinations forwarded by the examining teams No physical examinations were typed in September and October because the 4 available typists were engaged

TABLE 2 *Personnel involved in the processing of the examinees*

Location of examining team	Medical and dental personnel				Administrative personnel			Total
	Examining		Consulting					
	Officers	Civilians	Officers	Civilians	Officers	Enlisted men	Civilians	
Akron	8			5	6	6		25
Canton	7	2	5	25	4	5		48
Cincinnati	10	6	3	6	1	50		76
Cleveland	5	14	2	11	1	1		34
Columbus	16	8	6	16	4	19	28	97
Dayton	7							7
Lima	4	6	2	20	1	2	1	36
Mansfield	5	12	3	7	1			28
Portsmouth	3	1	1	2	1	2		13
Springfield	10		7		3	3		23
Steubenville	3			3	4	6	2	18
Toledo	8	5	6	7	2			28
Youngstown	5	12	5	12	4	3	4	45
Total	91	69	40	114	32	97	35	478

in endorsing requests for extended active duty orders, or in preparing letters of transmittal for returned forms (table 3) During this period, the medical section was under pressure to review at once physical examinations of key personnel Thirty or more local and long distance telephone calls per day were received from members of the 37th Division who desired information as to whether or not they were physically qualified so they could arrange their personal affairs

TABLE 3 *Proc sing at th M d cal Sect H dqua te f Ob M l tary D strict by m th*

Mo th	St d td Fo m 88		Requ t f r EAD
	Re ewed	Typed	
Septe b 1951	407	0	407
Oct be	1 872	0	1 872
No mb	2 730	626	1 963
Dec mb	3 147	4 773	197
Janu ry 1952	125	1 982	86
F brua y	28	14	0
Total	8 309	7 395	4 525

7 329 m w m d f wh m 66 w m d tw (7,395 for). In dd on 914 phy l m t f m w w d tw t t g t l f 8 309 e w d f m

I d h umb f qu ts f t d d ct d ty rd ma h d h phy l xam t p p f p wh d EAD p t 15 January 1952 Ord w t p bl h d by th Oh Mil t y D t unt l qu t f ord er d d by th m d l md g q l f f EAD

A total of 407 examinations were reviewed for personnel ordered to active duty in September to attend service schools and duty as members of advanced parties The peak load of typed examinations was reached in December necessitating the temporary transfer of 12 typists from other staff sections and the detailing of 8 enlisted men to work 3 hours each evening throughout December and the first 2 weeks of January The average time required by this office to process a medical examination form was estimated to be about 2½ hours

PROGRESS

By 1 December it was apparent that the 15 December deadline for completion of the physical examinations could not be met 526 men had failed to report for their examinations and 495 physical examinations were in the hands of the examining teams for additional information The Adjutant General Ohio requested that completed copies of the physical examination be furnished the components of the 37th Division by 1 January 1952 This date was 2 weeks earlier than our original target date for com-

pletion of the administrative portion of the project Thereupon, the Chief of the District directed that processing of the Division would have priority over all other work Authority to pay civilian typists for overtime work was granted. Personnel were intensely co-operative in volunteering many extra hours of work By 1 January 1952, all physical examination forms on hand in the medical section had been typed and forwarded The task could not be considered completed because many forms were at Headquarters, Second Army, for decision as to waiver or had been returned to examining teams On 14 January, 555 examination forms were pending final action, 249 of these were in the hands of teams for additional information, 151 were at Headquarters, Second Army, for decision as to waiver, and 155 members of the Division had failed to report for examination Fifty three members failed to complete their physical examination prior to departure for Camp Polk On 1 April, 48 examinations had not yet been completed and on 21 May the 37th Division had not completed all of these examinations

PROBLEMS

1 There was a constant demand, especially during October and November, for "emergency examinations" to determine the qualification of persons ordered to active duty prior to the federalization of the Division

2 Daily, there appeared in the office of the Medical Section, Ohio Military District, commanding officers who wished to know at once the status of key men in their respective commands

3 There were daily requests concerning examination results on men who were constitutents of certain legislators In some instances the legislator believed physical disqualification would give his man a more acceptable status in his community than an administrative release due to hardship Although pressure was placed on the reviewing board to disqualify men whose examinations qualified them for general duty, it conscientiously evaluated every case in the light of the medical history, physical findings, laboratory examinations, and consultants' reports

4. The following groups of examinees presented an important problem

a The examinee who sincerely desired to enter active duty with the Division, but who had physical defects or a history of defects which were disqualifying These men often attempted to conceal their defects

b The examinee who was aware of existing physical defects and desired extended active duty with the sole purpose of attempting to claim that the defect was a result of his

tour of active duty in the hope of receiving compensation from the Government.

c The examinee who hoped to avoid active duty by feigning physical defects When this was suspected our first step was to review his last annual National Guard physical examination Many examinees with disqualifying defects on *preinduction* physical examinations were found to have passed a physical examination for *promotion* with flying colors in August 1951

5 Personnel in some instances refused to be examined until after the Division was federalized Technically, they were within their rights, but it caused an annoying delay in the preinduction physical processing

6 A number of examinees, on advice of their unit commanders proceeded to service schools without official written orders On receipt of written request for retroactive active duty orders the medical section on review of the physical examination discovered disqualified personnel among these men Recall from the school was then necessary

7 An inactive guardsman, who was residing in Oklahoma was recalled On arrival in Ohio with his family his commanding officer directed him, with his concurrence to enter on active duty at once to assist with the administrative duty in conjunction with preinduction processing of the unit The commanding officer assured the officer that retroactive orders would be published placing him on active duty For about 1 month, he worked dili

TABLE 4 *Results of examination as of 14 January 1952*

	Number	Percent
Qualified Total	6 657	90 8
Outright	(6 547)	(89 3)
Temporarily disqualified but qualified on re-examination	(110)	(1 5)
Disqualified Total	672	9 2
Outright	(509)	(6 9)
Temporarily disqualified and disqualified on re-examination	(151)	(2 1)
Temporarily qualified	(12)	(0 2)
Total	7 329	100.0

Included 860 men who were graded

TABLE 5 *Distribution of disqualified examinees by cause of disqualification and order of frequency*

Disqualifying cause	Sole cause		Sole cause and in combination with other causes	
	Number	Rate per 1 000 examinees	Number	Order of frequency
Psychiatric	119	16 2	166	1
Hernia ulcers and other gastrointestinal diseases	64	8 7	72	2
Lower extremities	48	6 5	66	3
Spine and other musculoskeletal diseases	34	4 6	45	4
Lungs and chest	28	3 8	36	5
Heart	27	3 7	41	6
Blood pressure	25	3 4	38	7
Roentgenogram of chest	21	2 9	28	9
Vision	21	2 9	27	10
Upper extremities	20	2 7	29	8
Other defects		36 2		
Total		91 6		

gently but on physical examination he was found to be disqualified Activy duty orders could not be published, and because there was no provision for the Army or the National Guard to pay him for his duty, it was necessary for him to present a summary claim to the Ohio legislature

These were only a few of the problems encountered

RESULTS OF EXAMINATIONS

Perhaps the most gratifying feature of this project, a feature which compensated in a way for the diligence and toil expended by the personnel involved in the task, was the statistical material (tables 4 and 5) that evolved Sixty six men were examined twice The findings were the same in both examinations The most frequent cause for disqualification was some form of psychiatric condition It is our opinion that most examinees who had some psychiatric disqualifying condition, either actively or indirectly, were eliminated by this examination Many were discovered either through symptoms listed by the examinee on his Standard Form

89 or by other signs revealed on the Standard Form 88 The diagnosis in each case was confirmed by psychiatric consultation

The prevalence rate of syphilis as detected by positive serologic tests provided interesting statistics for comparison Studies made on selectees of World War II showed a rate of 30 1 per 1,000 selectees for the State of Ohio *(4)* A similar study, carried out in Ohio in 1949, showed a rate of 8 1 per 1 000 *(5)* The present examination showed a rate of 6 per 1 000 This remarkable drop is probably due to (1) general education of the public with resulting improvement of public co operation in syphilis surveys and prompt treatment of cases discovered (2) the advent of shorter courses of treatment of syphilis through the use of antibiotics and (3) the fact that the examinees represented a selected group Unfortunately no statistics concerning this division in past years are available for comparison

NOTICE OF PHYSICAL QUALIFICATION

Th d w ll not fy you wh the y ar qu lif d or di q al fi d fo ge l d ty F llow t tru t ns aref lly

1 Pl your full ame d pr e t mail g addres o the re rse sid Y ur pr s t rgan zat o thi id

2 Att h th s ard t the f m you fill d out for phys c l am att n

3 Aft the card h be n eturned t y u DO NOT MISPLACE IT Y u w ll d t sh ld y u be le ted fo rv school t be pl c d on e te d d t d ty p o to f d r l z tion of y unit

Y ar phys lly ☐q l f d ☐di q l f d

t rgan zat

ved I R iew g Off c r

Figure 1

RECOMMENDATIONS

1. Members or recruits of the National Guard should be more carefully screened prior to initial commission or enlistment because an initial disqualification of a physically unfit man saves funds required to support him during training periods and frees a vacancy which may then be filled by a qualified man

2 Standard Form 89 should be used in conjunction with all National Guard physical examinations because it requires the

(4) V d leh R. A. d U l L J Syph l m g m f dr ft g L d Sta ly f 1 895 778 l g po f men g d 21 35 wh w m d und Sel ct T g d Se vi A t f 1940 J A. M. A. 120- 1369-1372, De 26 1942

(5) F bl C. R W gh E O Do h J F d B lm J B Oh N on l G d blood-t ing pr gr m J V D Inf ma 31 231 234 Sept 1950

examinee to certify to the presence or history of many conditions which would indicate disqualification and which might easily be overlooked by the examining physician

3 A post card (fig 1) should be given to the examinee at the time of his preinduction physical examination When the result of his examination is established, the medical reviewing officer indicates qualification or disqualification on the card and mails it to the examinee through his unit commander The unit commander and the examinee know the result of the medical examination This advanced information will aid him in arranging his personal affairs and enables his unit commander to make plans to utilize or replace him in the unit

4 The names and number of persons who enter active duty prior to the federalization of the unit for the purpose of attending service schools should be made known to the unit The physical examinations of this group should be given first priority In the event of disqualification the State Adjutant General should be notified in writing He could then publish discharge orders

5 Unit commanders should initiate a system whereby closer check could be maintained on personnel of their respective commands in order to bring them to examination or to take administrative action against them when they purposely avoid the scheduled examination by the medical examining team or consultant

6 No man should be placed on active duty by verbal orders, and written orders should be published only after the examinee's physical examination has been reviewed and he is found to be physically qualified for general duty

DISCUSSION

Alvin L Gorby, *Brigadier General MC USA (6)* I consider this study a valuable guide for all personnel concerned with the medical processing of any large unit of the civilian components into Federal service I concur fully with the recommendation of the authors, especially with the need for more careful medical screening The loss of better than 9 percent for medical reasons seems high and certainly is not economical Careful initial examinations with periodic reprofiling should markedly reduce this figure

The preinduction medical processing of this Division resulted in the least possible economic and personal distress for the physically disqualified and eliminated uncertainties in regard

(6) Surg on Second Army

to induction The fine teamwork and liaison between the Ohio Military District Headquarters and The Adjutant General of Ohio in successfully completing these examinations prior to induction resolved many problems for the Second Army Headquarters particularly the Medical Section

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BOOK REVIEW

X R y Diagnosis of Ch t D e s by *Col ma B. R b n* M D A t t Cl al P f or of Med in C ll g of Phy i ia s d Surg ons Columbia U ty As ociate Phy c for Che t D se nd A ociat Rad log t Mt S n i Ho p l Con lt g Phy ian for Ch t D e s Beth El H spit l Se ior C ns lta t for Ch t Dis V te Adm i t tion 208 pag illustrated The W lliams & W lk C Balt more Md publ h s 1952

This book is a reprint of a section from Golden s Looseleaf Diagnostic Roentgenology with the same page numbers used in that text This system of page numbering is confusing at times The book is divided into 4 parts In the first part General Considerations the author discusses the uses and limitations of x ray in diseases of the chest roentgenographic technic special examinations fluoroscopy and the anatomy of the lun s s discussion on the limitations of x ray in the diagnosis of pulmonary diseases is thorough and instructive In Part II, Gen ral Roentgen Pathology the normal chest the author s method of examining the roentgenogram and pathologic shadows are described The pathologic changes in each disease from the first to the far advanced manifestations are discussed followed by an explanation of why the tissue changes cause the shadows een on the film Part III Regional Poentgen Pathology deals with each of the anatomic parts of the chest except the heart The diseases of these parts are described fully In Part I\ Dif ferential Diagnoses of Certain Roentgen Shadows there is much repetition of material covered in the other parts of the text In a way this section is a synopsis of the differential diagnostic points for certain types of shadow which are associated with those conditions that cause the most difficulty in interpretation A separate bibliography for each of the sections is given in the back of the book There is a good index This is an ideal book for the internist and the young roentgenologist It should be in all hospital libraries

—*Commander E P McLarney MC USN*

PLASTIC REPAIR OF THE EYELID[1]

BERNARD N SODERBERG *Colonel MC USA*
WILLIAM T SICHI *Colonel MC USA*
HAL B JENNINGS *Jr Lieutenant Colonel MC USA*

THIS article will stress early skin grafting for the burned eyelid and the necessity of fusing the palpebral margins In the 2 cases reported, there was marked ectropion of the eyelids following third degree burns The repair was accomplished by free grafts applied to the eyelids and tarsorrhaphy This procedure appears not to be well known because patients with cicatricial ectropion and corneal ulcer following similar burns are still seen This latter complication is associated with mild sequelas or, depending on superimposed infection, varying degrees of visual loss The resulting blindness demands elimination of the etiologic factor

CASE REPORTS

Case 1 A 22 year-old soldier sustained second and third degree burns of the face and extremities (fig 1) On admission to this hospital, his wounds were healed The early skin surfacing accomplished prior to admission showed the usual defects of cicatrix associated with this phase of treatment The exception was the severe ectropion of all eyelids, permitting chronic exposure of the cornea Bilateral corneal ulcers were present Surgical correction for the defect in the eyelid was accomplished 12 days after admission to the plastic and eye section At operation all limiting cicatrix was excised from the lids, permitting complete mobilization Skin grafts were substituted for the destroyed surface and tarsorrhaphy was performed immediately

Case 2 This patient had a marked involvement of one upper lid This area was grafted shortly after the initial trauma but no tarsorrhaphy was performed The postoperative appearance is shown in figure 2A The skin graft had contracted to such an extent that the patient could no longer close his eye There was ectropion with eversion of the conjunctiva The interpalpebral area of the eye globe, being unprotected, was in danger of ulceration The contracted skin graft was excised and a three quarter thickness skin graft from the inner aspect of the arm was fitted into the recipient site A tarsorrhaphy was performed

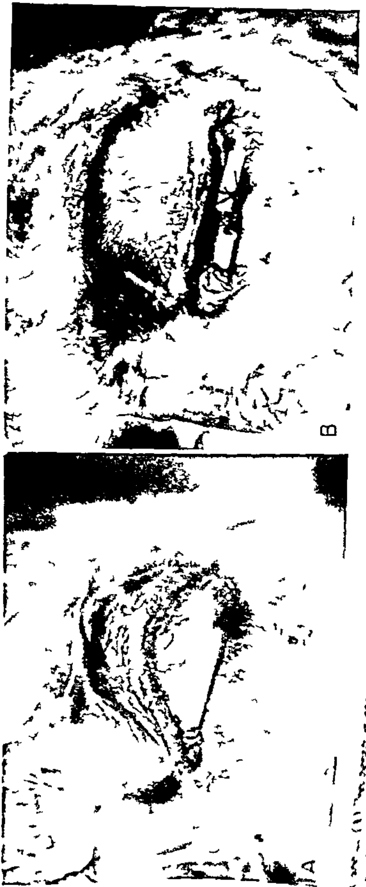
(1) Brook Army Hos [illegible]



F gur 1 (A) P p t appea a e how g ma k d cicat ci l ctop of all yel ds (B) App a a c aft k graft a d ta onhaphy

DISCUSSION

The free graft is the most satisfactory coverage for eyelids having large surface defects Several donor sites are available Each is examined to determine which has the best color match For small losses the graft could come from another eyelid and this would give the best appearance and function Grafts from the retroauricular area are satisfactory because the skin there



[illegible] (A) [illegible] appearance showing the result of skin graft without tarsorrhaphy (marked ectropion with eversion of con [illegible] (B) [illegible] skin graft was excised and the lid was mobilized and resurfaced Tarsorrhaphy sutures [illegible]

is thin and of good texture Ordinarily however, these transplants are too light in color appearing as white patches The supraclavicular area has a color which compares favorably with that of the face The inner aspect of the upper arm has also been used The skin graft from this area can be cut with the dermatome

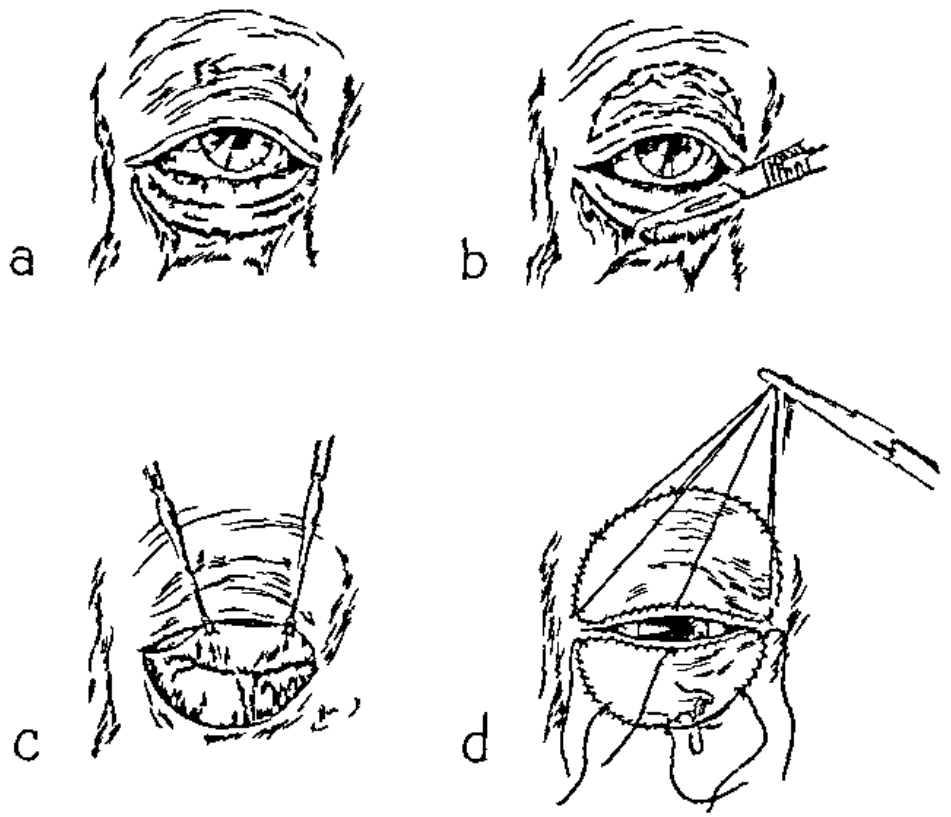


Fig 3 (a and (b) Area of cicatrix which was removed from patient (c) Scar excised (d) Bed prepared (long stent being placed)

If the principles of proper skin grafting are followed they will always take A piece of skin a little larger than the defect to be covered is removed and is tailored to fit the defect as it is sutured in place Care of the skin graft is important It should never be dropped into saline solution before transfer nor should it be allowed to dry out It should be handled gently with skin hooks and suspension sutures Thumb forceps crush tissue All scar is removed (fig 3 a b and c) in preparing the recipient site avoiding injury to the orbicularis oculi muscle levator palpebrae superioris or canthal ligaments Traction sutures through the rim stabilize the structure for operation The graft is appointed to the bed as soon as complete mobilization and hemostasis are accomplished Continuous sutures unite the skin edge to the transplant border Interrupted sutures are tied over the stent for graft fixation (fig 3d and fig 5b)

Tarsorrhaphy is performed just prior to stent fixation Inter marginal adhesions have held fairly well but do not offer the re sistance to contraction that tarsorrhaphy does With the former method the lids are handled with a biprong forceps, then a Graefe cataract knife is used The proper areas are denuded, avoiding

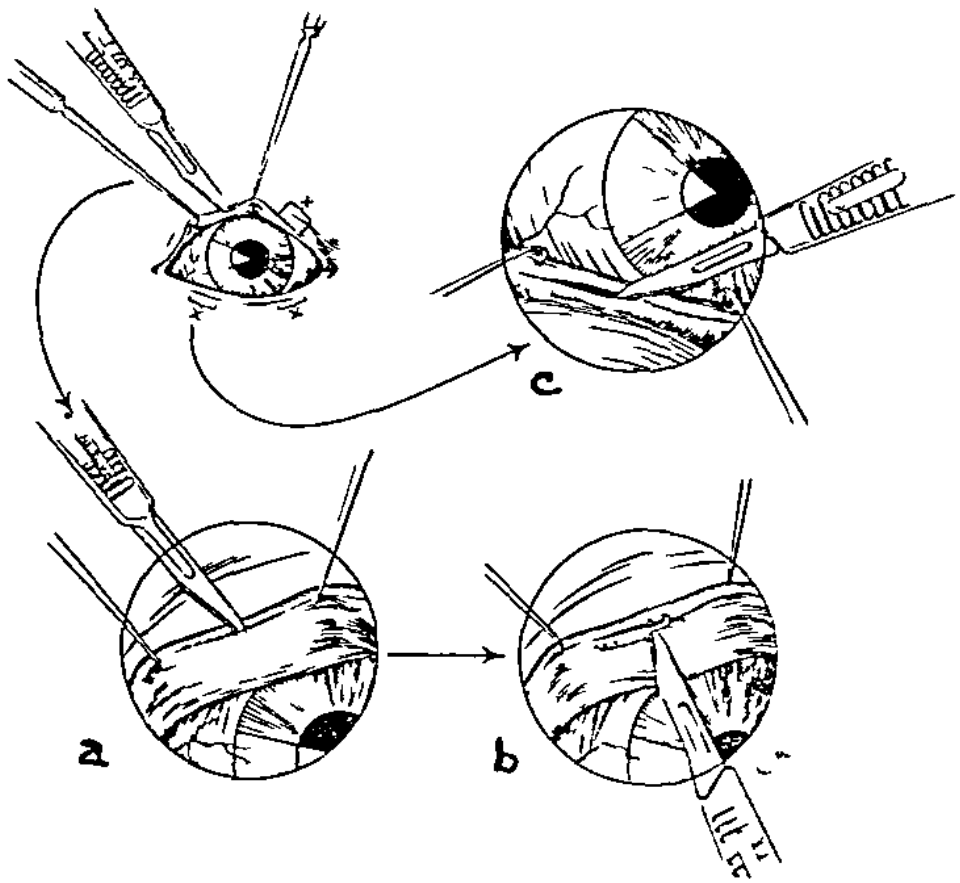


Figure 4 Diagram showing technic of tarsorrhaphy (a) *and* (b) *Incision into g ay line and excision of borde conjunct va on the posterior lamina* (c) *Corresponding incision in lowe eyelid*

the puncta lacrimalia Two areas are prepared, one on each side of the pupil, between it and the canthus Anatomically the lower puncta is further out on the lid than the upper This must be borne in mind in order to place the excisions in the correct loca tion Through and through mattress sutures hold the lids together The sutures are tied over rubber pegs If no eye is present, it may be well to use a plastic conformer This would be left in the cul de sac A more extensive tarsorrhaphy would be accom plished in this situation Our experience has shown that inter marginal adhesions have not been satisfactory In inexperienced hands one of two complications ordinarily occurs—either too little tissue is removed and adhe ions are inadequate or too large an area is excised with subsequent coloboma An alter native method is recommended (figs 4 and 5) This technic pro vides paramedian intermarginal adhesions strong enough to re

is thin and of good texture Ordinarily, however these trans plants are too light in color appearing as white patches Th supraclavicular area has a color which compares favorably wit that of the face The inner aspect of the upper arm has also bee used The skin graft from this area can be cut with the dermatom

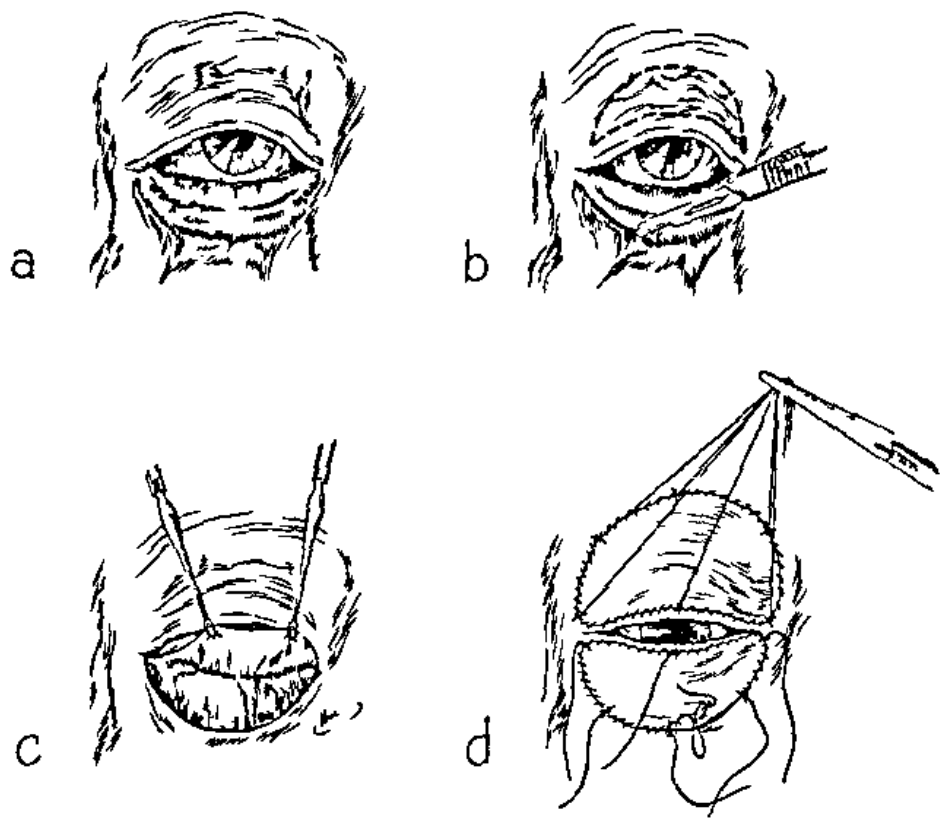


Fig e 3 (a) a d (b) A a of c cat x which w e emoved f m patle t ( ) Sca xcis d (d) Both l ds f ed (l ng t e t be t ed o er si d s g)

If the principles of proper skin grafting are followed, they w always tal e A piece of skin a little larger than the defect to cov ered is removed and is tailored to fit the defect as it is tured in place Care of the skin graft is important It should ne be dropped into saline solution before transfer nor should it allowed to dry out It should be handled gently with skin hoo and suspension sutures Thumb forceps crush tissue All s is removed (fig 3 a b and c) in preparing the recipient s avoidin, injury to the orbicularis oculi muscle levator palpeb superioris or canthal ligaments Traction sutures through rim stabilize the structure for operation The graft is appo ed the bed as soon as complete mobilization and hemostasis accomplished Continuous sutures unite the skin ed e to transplant border Interrupted sutures are tied over the stent graft fixation (fig 3d and fig 5b)

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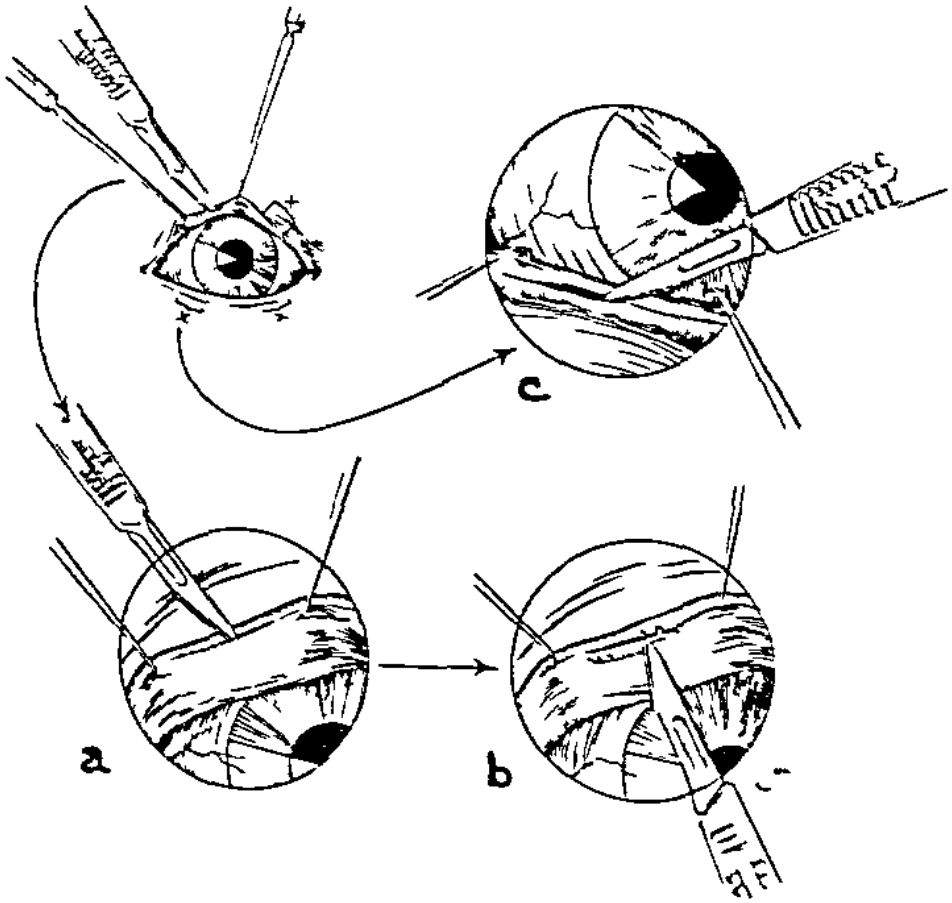


Figure 4 Diagram showing technic of tarsorrhaphy (a) and (b) Incision in gray line and excision of border conjunctiva on the posterior lamina (c) Corresponding incision in lower eyelid

the puncta lacrimalia Two areas are prepared, one on each side of the pupil between it and the canthus Anatomically the lower puncta is further out on the lid than the upper This must be borne in mind in order to place the excisions in the correct location Through and through mattress sutures hold the lids together The sutures are tied over rubber pegs If no eye is present, it may be well to use a plastic conformer This would be left in the cul de-sac A more extensive tarsorrhaphy would be accomplished in this situation Our experience has shown that intermarginal adhesions have not been satisfactory In inexperienced hands one of two complications ordinarily occurs—either too little tissue is removed and adhesions are inadequate, or too large an area is excised with subsequent coloboma An alternative method is recommended (figs 4 and 5) This technic provides paramedian intermarginal adhesions strong enough to re

Case 2 A 20-year old man, who was in good health until 3 days prior to admission, noted pain and tenderness in the coccygeal area He was examined and told that he had a pilonidal cyst Diathermy was given with no improvement. On the day prior to hospital entry a draining sinus appeared

Physical examination on admission revealed a large, fluctuant mass in the midline between his gluteal folds Three draining sinuses were seen His temperature was 99 4 F The leukocyte count on admission was 8 250 At no time did it exceed 15 800 The Arneth count consistently was shifted to the left. On admission the hemoglobin was 16 grams per 100 cc A moderate normochromic anemia developed and frequent blood transfusions were given to keep the hemoglobin at about 12 grams pe 100 cc

Aureomycin was given in doses of 250 and 500 mg q i d On the day following admission, incision and drainage of the abscess was performed Five days later, under low spinal anesthesia, the sinus was unroofed and marsupialized The patien tolerated the procedure well, and postoperatively bacitracin packs were applied to the wound On the first postoperative da he had a small amount of bleeding from the wound and his temperature rose to 101 4 F On the next day he had chills fever and sweats A septic course persisted and on the fourth postoperative day a blood culture was positive for hemolytic *Staph aureus* coagulase positive This organism was sensitive t chloramphenicol Subsequent blood cultures (9 in all) consistently grew a similar organism Later sensitivity studies showe organism to be inhibited by penicillin chloramphenicol, neomycin, bacitracin polymyxin B chloramphenicol streptomycin and triple sulfonamides Slight inhibition was noted to polymyxin B alone and resistance had developed to chloramphenicol alone The organism was also resistant to penicillin aureomycin and streptomycin alone This organism was cultured from fluid from the left lung

On the eleventh day shortness of breath and chest pain occurred The physical findings at that time were thought to be due to pneumonia On the twelfth day a cardiac murmur was heard It was initially described as blowing in character and best heard at the cardiac apex Shortly thereafter the heart was found to be grossly enlarged and a grade 3 blowing systolic murmur was heard with the maximum intensity at the lower end of the sternum A diagnosis of acute bacterial endocarditis of the tricuspid valve due to hemolytic *Staph aureus* was established At this examination the spleen was palpable and a pleuropericardial friction rub was heard

Figure 1 Graph showing ma mum te l y t ml

In spite of extensive therapy with aureomycin, terramycin penicillin, chloramphenicol, streptomycin, and gantrisin the septic course continued Thirty eight days after operation a localized pneumothorax seriously impaired his marginal pulmonary reserve A thoracentesis was performed and a large amount of air and 300 cc of serosanguineous fluid were removed Two days later the pulmonary findings were those of tension pneumothorax A thoracotomy tube was placed in the chest and suction applied His course continued to be unfavorable and 51 days after operation he died (fig 1)

At autopsy the right pleural cavity contained 400 cc of thin cloudy fluid The left lung was partially collapsed by virtue of air in the pleural space Scattered throughout both lungs were innumerable small nodules measuring up to 2 cm in diameter On incision these were seen to be abscesses in various stages of evolution There was a cystic cavity 3 cm in diameter in the right lower lobe Some of the abscesses located immediately beneath the pleura had ruptured into the pleural space On section there was honeycombing of suppuration and cavitation The suppurative foci were seen to contain colonies of bacteria

The heart weighed 400 grams The tricuspid ring was dilated and the tricuspid valve leaflets contained an abundant crumbly fibrin deposit which had spread to involve the chordae tendineae One leaflet of the valve was almost completely destroyed A thin mural thrombus was found in the right ventricle near the ulcerated valve leaflet Sections of the tricuspid valve area showed necrosis of the valve structure much of which was replaced by masses of fibrin containing degenerating leukocytes and colonies of blue-staining bacteria No evidence of systemic embolism was noted The spleen weight was 680 grams In the pilonidal area there was an open, granulating wound which was the site of the recent excision of a pilonidal cyst The postmortem diagnosis was (1) acute bacterial endocarditis of the tricuspid valve, (2) multiple septic infarcts of both lungs with cavitation and spontaneous rupture into the left pleural space (3) bilateral acute pleuritis and (4) septic hyperplasia of the spleen

Comment In the first patient widespread systemic embolization occurred and resulted in death but because the tricuspid valve alone was involved in the second patient, the expected pattern was multiple pulmonary emboli due to fragmentation of bacterial vegetations This syndrome has been described in several reviews and case reports *(9, 11, 13 20 23)* Acute bac

(20) H y H H. K lth T F Sch f B F d W l h B J Sep cem and b ct al d ca d t s te lti g fr m h m add t p f 5 J A. M. A. 126 535-538 Oct. 28 1944.

tenal endocarditis limited to the tricuspid valve and due to hemolytic *Staph aureus* is extremely rare *(9 11 20 21, 23)* Goldburgh et al *(13)* reported that 11 of 581 (1 5 percent) cases of nonpneumococcus acute bacterial endocarditis were limited to the tricuspid valve

DISCUSSION

These two cases not only present interesting diagnostic considerations, but they reflect a threatening trend in our bacterial population A host of articles and editorials have warned the medical profession of the versatility and adaptability of bacteria *(2 9-11)* Through a variety of mechanisms many organisms have become resistant to one or more of the antibiotics in current use Hemolytic *Staph aureus* has been a classic example of this trend Multiple studies have demonstrated that an increasing number of strains are naturally resistant to penicillin *(7 8 9)* Beginning with the studies of Barber and Rozwadowska-Dowzenko, reports have demonstrated the increasing incidence of naturally resistant strains of *Staph aureus* being met in hospital practice Resistance to other chemotherapeutic agents has also become common and the early conclusions that penicillin resistance could be effectively combated by the use of aureomycin or chloramphenicol already need revision *(1 7)*

At present, antibiotic combinations offer hope of solution of some phases of this problem *(8)* A rational program to combat this ability of bacteria to select, adapt habituate and substitute must include close cooperation between bacteriologist and internist Although in vitro sensitivity tests are not infallible, they give the clinician a definite indication of the antibiotic course he should pursue Not only should the right agents be used, but they should be employed in adequate amounts The development of resistance by pyogens during therapy is not common but does occur, and the early use of large doses of bactericidal or bacteriostatic drugs will assist in its prevention

The second case demonstrates many aspects of this problem Early in the hospital course, sensitivity to chloramphenicol in vitro was demonstrated. Doses routinely considered adequate, supplemented by other antibiotics, were unsuccessful Antagonism between chloramphenicol and penicillin may have been a factor, but this cannot be proved Later in the hospital course, the organism had become resistant to chloramphenicol but, in

(21) Wilhelm F Hu h J L J assey H H and Dowli g H F Tr atm t f acute b cterial endocarditis with penicillin Ann Int M d 2(221 2 Jul 1947
(22) Barker P S. Clinical study of a bacteriostatic infection of right side of heart or pulmonary artery Am Heart J 37 1044-1069 J n 1949
(23) Luttgens W F Endocarditis in main line addicts report of 11 cases Arch Int Med 83 (3 A J ne 1949

the test tube was inhibited by a chloramphenicol penicillin combination Clinically no response w..s seen to these two agents simultaneously administered so it must be assumed that the dose was too small

A host of schedules for the treatment of acute bacterial endocarditis may be found Organ and Donegan *(24)* present a review up to 1950 No one program can be considered universally adequate and no such claims have been made In the interim between diagnosis and sensitivity studies the patient should receive large doses of antibiotic combinations Early diagnosis and intensive therapy offer the best solution to the problem presently confronting the physician caring for the patient with acute bacterial endocarditis The future holds the possibility of better chemotherapeutic agents and a continually decreasing incidence of this disease as recognition of the potentially serious nature of infection and valvular lesions becomes more widely disseminated It is further to be hoped that casual antibiotic therapy for bacterial infections will diminish as physicians become aware of the increasing incidence of bacterial resistance

(24) O g n E S d Do ga C K T m t f ba l docard s Ann l M d 32 1099-1113 J 1950

Immunization Requirements

An important new regulation for Army (SR 40 °30-1), Navy (BUMEDINST 6230 1) and Air Force (AFR 160 102) entitled Prevention and control of communicable diseases of man Immunization requirements and procedures " has been published (5 Nov 1952) The requirements are set forth for initial immunization reimmunization and special immunizations for four areas covering the entire globe Strict adherence to these regulations will eliminate much of the unnecessary shot taking practiced in the past

EFFECTS OF CORTISONE ON ACUTE RHEUMATIC CARDITIS[1]

H C GIBSON *Colonel* MC U S A
DAN V SLOVEY *Captain* MC U S A
THOMAS C CLIFFORD *First Lieutenant* MC U S A
DAVID J OPPENHEIM *First Lieutenant* MC U S A

THE treatment of acute rheumatic carditis with ACTH and cortisone has received much attention (*2, 3*) The patients reported have been treated in all stages of the acute phase of the disease No agreement has been reached regarding dose and duration of therapy This treatment results in a rapid subsidence of acute symptoms, but the incidence of recurrent and residual valvular heart disease has not been determined

The course of acute rheumatic carditis in children on salicylate therapy is usually of several months duration, and in some it is years before all signs of acute carditis subside Electrocardiographic changes and elevated sedimentation rates persist for weeks, months, or even years after clinical signs have disappeared When the inactive stage is reached about two thirds are left with signs of rheumatic heart disease (*6*) In adults, the course of the acute disease is variable but in general is less prolonged than in children and the mortality rate during the acute phase is quite low Most of these patients survive, many with chronic crippling valvular heart disease

No attempt is made here to review the general effects of hormone therapy nor to describe the already often repeated

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(1) From the U S Army Hospital F ... J ...kson S C

(2) Hench P S Slocumb C H Polley H F and Kendall E C Effect of cortison and pituitary adrenocorticotropic hormone (ACTH) in rheumatic diseases J A M A 144 13 1335 D 16 1950

(3) Dorfman A Small K Bragdon J D M Hayward R Mull R Olsen D and Senz E Effect of adrenocorticotrophic hormone in the management of rheumatic P diatrics 8 603-615 N 1951

(4) Mason H B F and Warren J E Effect of pituitary adrenocorticotrophic hormone (ACTH) on rheumatic fever and the mucocutaneous tissues J A M A 144 1335-1341 Dec 16 1950

(5) Hutton A G Baldwin J S Maloney C Bunim J J Ziff M and Ford D K Effect of ACTH and cortisone in rheumatic carditis Observations on 18 cases J A M A 148 628-634 Feb 23 1952

(6) Bland E F and Duckett J T Rheumatic fever and rheumatic heart disease 20-year report on 1000 patients followed in childhood Circulation 4 836-843 Dec 1951

mechanisms Currently under the auspices of the American Heart Association and the British Medical Research Council there is a co operative study in 13 research centers to determine the relative values of ACTH, cortisone, and aspirin in the treatment of rheumatic fever (7)

We have observed the effects of cortisone on acute rheumatic carditis in 4 soldiers and have followed their progress for from 9 to 16 months These men were all from an Infantry Replacement Training Division which has continuous increments of inductees All were from the southeastern states They ranged in age from 19 to 27 years, and were admitted to the hospital early in the acute stage of rheumatic carditis None gave a history of previous attacks of rheumatic fever although one had been known to have a mitral systolic murmur for several years All had ECG s consistent with acute pericarditis and 3 had friction rubs Two were admitted within 24 hours after development of symptoms of acute rheumatic fever One of these had joint manifestations for about 4 days and the other for 3 weeks prior to admission All 4 patients were given cortisone within 72 hours after admission and all received antibiotics

CASE REPORTS

Case 1 A 20-year-old man was admitted to this hospital on 20 December 1950 Three weeks prior to admission he developed pain redness swelling, and stiffness in his ankles but continued his usual activities These symptoms persisted, then 4 days prior to admission a low grade fever developed Subsequent swelling, redness, and pain in both knees and severe pain in anterior portion of his chest developed On admission he was acutely ill dyspneic and ashen gray with a temperature of 100 8 F a pulse of 140 and 30 respirations per minute Tenderness, swelling and hyperemia of both ankles and knees were present There was a gallop rhythm, but no murmurs were audible Moist rales were heard in the base of both lungs His sedimentation rate was 30 (Cutler) His leukocyte count was 16,000 His ECG (fig 1) showed elevation of the S-T segment in leads I II, and CF_4 A diagnosis of acute rheumatic fever and carditis with early cardiac decompensation was made

A grade II systolic mitral murmur and a pericardial friction rub was heard over the mitral area 48 hours after admission The patient weighed 136 lb Treatment with cortisone was started 57 hours after admission He received 300 mg in the first 24 hours 200 mg in the second and subsequently was maintained on from 25 to 100 mg daily A total of 3 grams was given in 38 days

(7) Ed t r l A Co p St dy N w E gl d J Med 247 186 J ly 31 1952.

There was a period of 2 weeks in the middle of the course in which treatment was discontinued because of complications

At the end of 24 hours of treatment there was beginning relief in symptoms and complete cessation of joint and chest pain in 48 hours The heart rate became normal after 24 and the temperature after 48 hours Gallop rhythm and swelling and redness of joints had disappeared in 48 hours The rales noted on admission had completely cleared at the end of 72 hours The pericardial friction rub and systolic apical murmur were no longer heard after 4 days

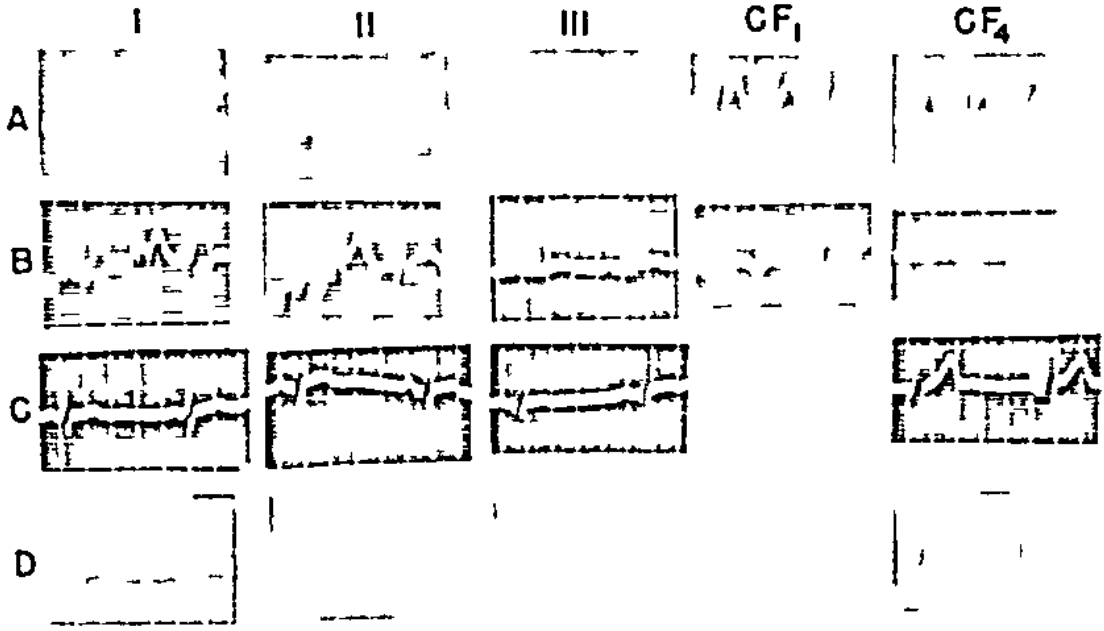


Figure 1 (A) On admission Rate 128 S-T segment elevation. (B) Three days after starting cortisone therapy Rate 78 T wave low in CF_4 (C) Eleven days after starting cortisone therapy Rate 62 S-T segments normal T wave low in II (D) Four months after admission Normal tracing

The leukocyte count became normal (9,350) by the sixth day Within 11 days after treatment was instituted the ECG was normal (fig 1) The sedimentation rate remained elevated (5 to 15) for 4 months

The patient's course was complicated by the finding of glycosuria within 24 hours after cortisone was first administered Fasting blood sugar determinations ranged between 142 and 155 mg per 100 cc but then returned to normal The patient also developed depression and ideas of reference These cleared 2 weeks after treatment with cortisone was discontinued and it was started again He had one further brief similar episode after treatment was resumed Two months after the completion of treatment he had no evidence of rheumatic involvement except for the persistent elevation in the sedimentation rate This might be

explained on the basis of 6 periapical abscesses which necessitated extraction of teeth during the fifth month of hospitalization At the end of 7 months there was still no evidence of recurrence Physical examination, ECG and sedimentation rate were normal He was discharged to duty

A follow up examination on 10 March 1952 (15 months after the onset of acute illness) was negative

Case 2 A 19 year old man was admitted to this hospital on 21 January 1951 During the preceding 2 weeks he had had a sore throat and other symptoms of acute upper respiratory infection

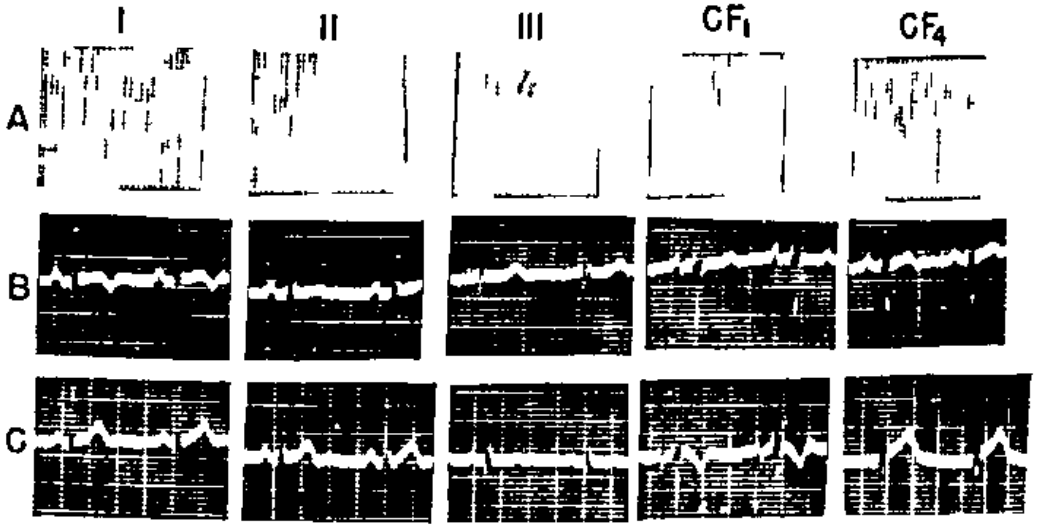


Fig 2 (A) On adm o Rate 110 S T segm t l at (B) S day after t t ng co ti th apy Rat 80 S T ele t T waves in v t d I and CF4 (C) Se u k after adm o N rm l t aci g

Fever and painful swelling of his right knee appeared on the day before admission Following this he had multiple joint involvement generalized malaise pain in the anterior portion of his chest and anorexia His temperature was 101 F His pulse was 136 His respiratory rate was 24 Hyperemia of his pharynx and tonsils was marked There was a gallop rhythm but no murmurs or rales were heard Both knees elbows ankles and shoulders were swollen warm and tender The sedimentation rate was 34 (Cutler) The white blood cell count was 13 000 The FCG (fig 2) showed S-T segment elevation in leads I, II and CF_4 A diagnosis of acute rheumatic fever with carditis was made

The patient weighed 198 lb Cortisone was started 7° hours after admission He received 300 mg on the first day 100 mg on the second and then 75 or 100 mg daily A total of 3 grams was given in 36 days There was complete relief of his joint pain and a decrease of gallop rhythm in 48 hours His tachycardia persisted for 7 days and his temperature returned to normal in 8

days A systolic murmur was [illegible] 2 days after treatment was [illegible] for 2 weeks A friction rub was [illegible] after treatment with cortisone was [illegible] persisted for [illegible] The ECG [illegible] after 3 weeks The leukocyte [illegible] but became normal (6,600) at the end of [illegible] The sedimentation rate remained elevated for 3 weeks

This patient developed pulmonary edema 2 hours after treatment with cortisone was started He was given digitalis and mercurial diuretics in addition to the cortisone After 5 days he was compensated After 15 days digitalis was discontinued A roentgenogram and fluoroscopy of his chest revealed generalized cardiac enlargement and pulmonary congestion Six weeks later the roentgenogram of his chest was normal Acne appeared 1 month after treatment with cortisone was started This disappeared gradually following discontinuance of the drug This minor complication is not uncommon Two months after completion of treatment there was no evidence of cardiac involvement The patient was discharged to duty on 11 May

A follow up examination in November 1952 was negative

Case 3 A 27 year-old man was admitted to this hospital on 27 February 1951 Two weeks prior to admission he developed symptoms of acute coryza with a sore throat These symptoms persisted and 1 week before admission he was given 300,000 units of procaine penicillin in oil On the following day both knees became painful The pain progressively increased during the next 4 days becoming so severe that 1 day before entering the hospital he was unable to walk On admission joint pain was his only symptom

His temperature was 99 4 F His pulse was 82 His respiratory rate was 20 Both knees were tender swollen and contained fluid Cardiac rhythm was regular and no murmur or friction rub was heard A roentgenogram of his chest showed no cardiac enlargement His sedimentation rate was 24 He had no leukocytosis His ECG showed elevation of the S-T segment in CF$_4$ (fig 3) His symptoms remained unchanged and treatment with cortisone was started within 72 hours He was given 200 mg on the first day 200 mg on the second and 100 mg daily thereafter A total of 3 grams was given in 21 days His joint symptoms disappeared in 48 hours At no time was there any temperature elevation or tachycardia There were no auscultatory findings until 16 days after treatment was started, when a grade I apical systolic murmur was heard which persisted No friction rub was heard On the thirty sixth day the ECG showed changes which

were more striking and suggestive of more extensive cardiac involvement On the forty second day these changes reverted toward normal but at the end of 5 months the ECG was still abnormal At 6 months the only abnormality was slight elevation of T segments in V_3 and V_4 There was no leukocytosis at any time

The sedimentation rate remained elevated (9 to 16) as late as 6 months after the onset A fasting blood sugar was found to be 177 mg per 100 cc 1 day after treatment with cortisone was started, but subsequent determinations revealed normal values

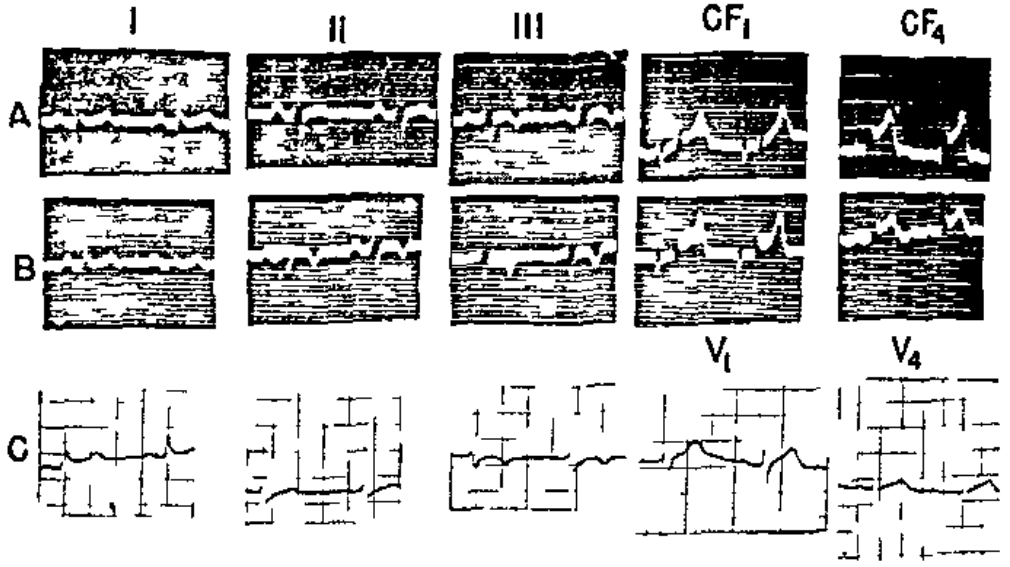


Fig 3 (A) On admission Rat 76 ST segment elevation CF1 and CF4 (B) Thirty six days after starting cortisone therapy Rat 88 inversion of T wave ST segment elevation in CF1 and CF4 (C) Six months after admission Normal tracing

After 6 months the patient was discharged from the hospital asymptomatic with negative physical findings except for a grade I apical systolic murmur The ECG and laboratory studies were normal except for slight elevation of the sedimentation rate

A follow up examination 15 months after admission revealed no change in the physical findings or the ECG

Case 4 A 24 year-old man was admitted to this hospital on 20 September 1951 In March 1950 when he tried to re-enlist in the National Guard he was told he had a heart murmur Following this he had had vague symptoms palpitations occasional heavy precordial distress some exertional dyspnea and a feeling as if his heart were missing beats He had had frequent sore throats all his life and in 1949 had had a severe attack necessitating bed rest for 2 weeks Two weeks before admission he again developed a sore throat but on admission he was afe-

bile and no friction rub was heard. On the following day his temperature was 101 F. The pulse rate was 120. There were small tonsillar tags and moderate pharyngeal injection. He had a grade II systolic murmur at the apex and a to and fro pericardial friction rub which was best heard over the precordium. There was a gallop rhythm and a few premature contractions. He had no lymphadenopathy. A roentgenogram of the chest showed no cardiac enlargement. An ECG taken on the day before admission was normal.

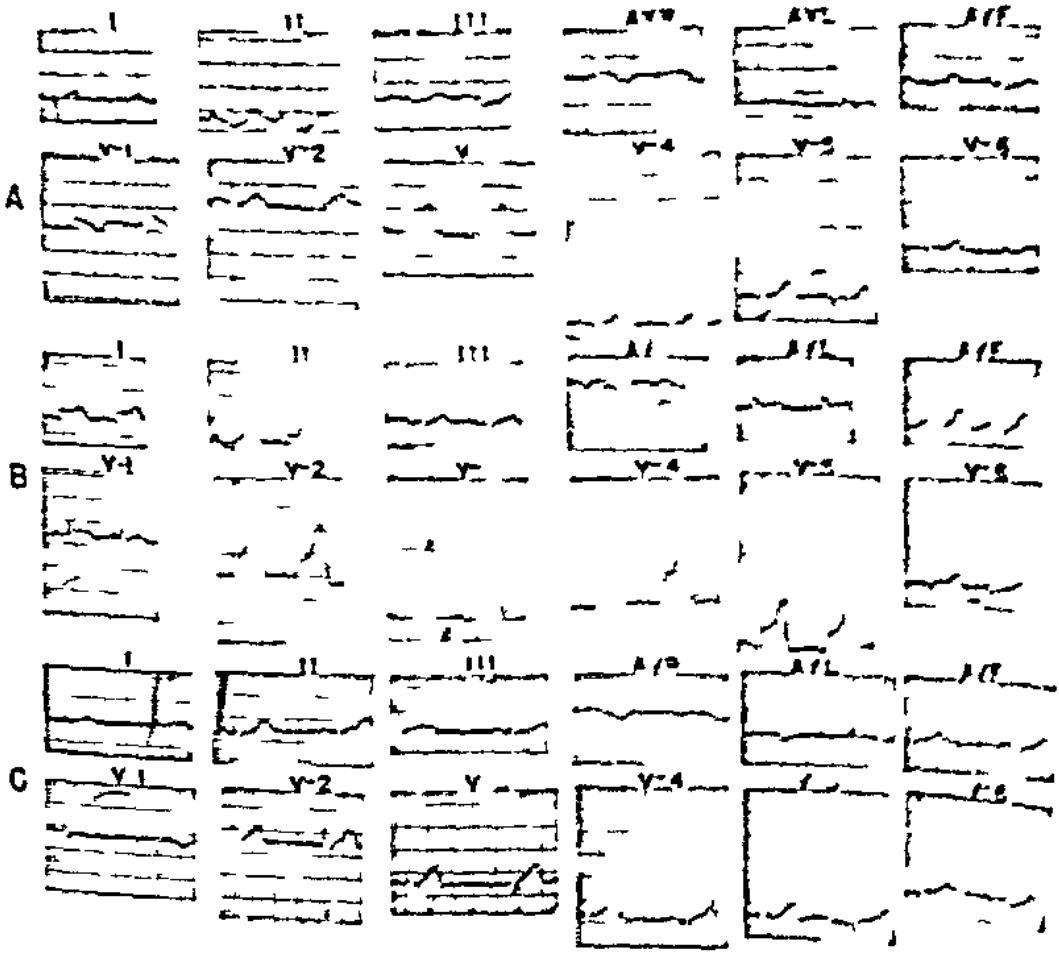


Figure 4. (A) On admission. Slight elevation of S-T segment in V_1 with ... ent 24 hours earlier. (B) Twenty-five days after starting cortisone therapy and at time of acute exacerbation. S-T segment elevation in I, II, V_2, V_4 and V_5. (C) Ten days later. Normal tracing.

Treatment with cortisone was started 24 hours after ... entry. He was given 300 mg. on the first day, 200 mg. ... second, and from 25 to 150 mg. daily thereafter. A total of ... 4 grams was given in 6 weeks. Within 24 hours after ... was begun there was a general subjective improvement ... appearance of the gallop rhythm. The temperature was ... 48 hours. The pulse fell from 96 to 72. The systolic ... murmur noted on entry persisted unchanged throughout ...

course The sedimentation rate was normal by the nineteenth day By the twenty fifth day the dosage of cortisone had been reduced to 25 mg but on the following day the patient had an acute exacerbation of weakness fever feeling of impending doom and generalized thoracic pain The friction rub heard on entry had disappeared 4 days after treatment was started but was again noted 4 days later and was heard intermittently for 3 weeks It was present during the exacerbation of ymptoms At this time the dose of cortisone was increased to 300 mg for 1 day 200 mg for 1 day, then 100 mg daily with gradual reduction The friction rub disappeared within 3 days after the second course of treatment was started and never returned

The ECG which was normal prior to hospital admission, showed S T segment elevation on the day treatment with cortisone was started (fig 4) This abnormality remained unchanged until the twenty sixth day Associated with the acute exacerbation the ECG showed significant changes from those previously noted but returned to normal in 10 days and remained normal thereafter

After treatment with cortisone was renewed in larger doses the temperature returned to normal in 48 hours The sedimentation rate which had risen to 16 and the leukocyte count, which had risen to 16,950 with the acute exacerbation returned to normal in 1 week and remained normal The patient was observed for 4 months after completion of treatment with cortisone He continued to complain of recurrent arthralgias and occasional thoracic pain At the end of 9 months he was asymptomatic except for transient arthralgias The systolic apical murmur was unchanged but the ECG sedimentation rate and leukocyte count were normal

RESULTS

The acute symptoms followed the pattern reported by others Fever returned to normal in all but 1 patient (case 2) within 48 hours after treatment with cortisone was started In this patient whose fever lasted 8 days and was associated with severe congestive failure it is now thought that the dosage was low during the first 4 days of treatment In the face of pulmonary edema and cardiac dilatation however, the dose was increased to 150 mg daily on the fourth day of treatment Following this evidence of congestive failure cleared rapidly Of the reports of the use of cortisone in the treatment of rheumatic carditis reviewed *(3 5 8, 9)* a significant percent of each series developed con

(8) H s, T N Abr m W B L T F P d Hubb d J P Co so th py cu h uma ditu p lun y b rv t Cir l on 3 215-223 F b. 1951

(9) Ba A R Eff f and ACTH 14 p w th cu heum f P Staff M t M y Cl 25 478-479 A g 16 1950

gestive failure Several of the observers questioned whether the decompensation noted was a complication of cortisone therapy or of the underlying rheumatic carditis Some have suggested that cortisone *should* be given to patients with decompensation associated with acute rheumatic carditis because its action presumably relieves the underlying inflammatory process

Except for 1 patient (case 2), tachycardia and gallop rhythm disappeared within 48 hours Our 4 patients had murmurs during the acute episode In 2, the murmurs disappeared completely and in 1 the murmur persisted unchanged In the fourth, in whom there was a murmur antedating the acute symptoms, no change was noted Friction rubs were present in 3 patients In patient 1, the rub persisted for 4 days In patient 2, the rub was first noted 48 hours after cortisone therapy was started and persisted for 10 days In patient 4, a friction rub was noted on admission and was heard intermittently for 3 weeks At this time, while the patient was receiving only 25 mg of cortisone per day, he had an acute exacerbation of his carditis, and the dose of cortisone was increased to 300 mg per day After 3 days of this therapy the rub was no longer heard

In all 4 patients there were electrocardiographic changes consistent with pericarditis In patient 3 this was the only evidence of pericarditis because no friction rub was heard All 4 patients showed abnormal S-T segment and T wave changes prior to the beginning of treatment and all reverted to normal Two of these were normal within less than 2 weeks, 1 in 36 days, and 1 remained abnormal for 4 months changing gradually to normal in 6 months The P R interval was normal throughout in all 4 patients A review of recent literature revealed that in patients followed by ECG, the most common abnormality noted was prolongation of the P R interval There are very few reports of consistent return of the S-T segment and T waves to normal following treatment, but there are reports of abnormal conduction time returning to normal (*2 3*) Kuttner et al (*5*) reported 9 patients with pericarditis treated with ACTH and cortisone, in whom all evidence including electrocardiographic abnormalities disappeared within 3 weeks

DISCUSSION

Salicylates lower the fever and relieve pain and discomfort in the articular tissues in patients with rheumatic fever Whether salicylates shorten the course of the disease or prevent cardiac involvement is still under discussion (*10*) Striking symptomatic relief with cortisone and ACTH has been described in increasing numbers of patients It is becoming clear that the adrenocortical

(10) Evans W A Treatment of Heart Disease W B Saunders Co Philadelphia Pa

steroid hormones do not permanently modify the pre-exi tin pathologic lesions *(11)* The persistence of lesions was dem onstrated at autopsy by Spain and Roth *(12)* There is however insufficient evidence to quell the hope that these hormones in terrupt the progress of lesions and prevent the formation of new Aschoff bodies in the myocardium and cardiac valves

If these drugs in adequate dosage check the course of rheumatic fever the residual cardiac damage may then depend on how early in the disease treatment is started Acute joint involvement frequently precedes evidence of carditis in young adults The possibility of preventing heart damage by early therapy may be *especially good in those patients in whom the acute episode* manifests itself first in the joints This however must await statistical study of a large number of treated patients The 4 pa tients reported here all had acute carditis from 1 to 3 days be fore therapy was started hence a certain amount of valvular damage may be expected

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(11) Sh w C C. Cl l q f ACTH d M l S g 110 42-51 J 1952

(12) Sp D M d R h D Eff t f n d ACTH h p th l gy f h m t di p t f p d Am J M d 11 129-131 July 1951

BOOK REVIEW

Th Ca dbo d Gi nts by *Pa l Ha k tt* 309 pag s G P P tnam So *N w Y k N Y p bl sh r 1952 P ice $3 50*

This book is purported to be the autobiographic experiences of a veteran who was admitted to a Veteran s Hospital with a diag nosis of a schizophrenia paranoid type severe with poor prog nosis After a year of hospitalization he was discharged The author describes his illness ably Later there are some rems of discussions among patients and others including one with a Doc Shepard in a late latrine session This book is not recom mended for patients and it adds nothing to the psychiatrist s knowledge —*Comdr S V Thompson MC USN*

EPIDERMOID CYST OF THE SPLEEN

LAWRENCE L. BEAN *Captain MC, U. S. N.*

LeROY H. STAHLGREN *Lieutenant junior grade MC, U. S. N.*

CYSTS of the spleen are uncommonly encountered but because they frequently present fairly typical clinical findings, they can occasionally be correctly identified preoperatively. The literature relating to epidermoid cysts of the spleen was reviewed by Shawan *(1)* who reported 4 cases, and later by Radakovich *(2)* who added 1 of his own and collected 6 others. Other types of splenic cysts are seen more commonly and include (1) primary or true cysts (congenital, traumatic, inflammatory, neoplastic *(3)*, and echinococcus) and (2) secondary or false cysts which have no true epithelial lining and are due to trauma, inflammation, or degeneration *(4)*.

CASE REPORT

A 21 year-old man was admitted to the U. S. Naval Hospital, Guam, on 3 March 1952, by a physician who had noted the presence of an abdominal mass on routine physical examination.

Although the patient was aware of the mass, it did not interfere with his daily activities which included climbing a 60-foot ladder to an observation tower several times daily. He had first become aware of the abdominal swelling 6 or 7 months before admission and stated that the enlargement seemed to be increasing fairly rapidly. There was no noticeable change in appetite or weight. He had observed however that the caliber of his stools had decreased slightly. This was interpreted to be the result of extrinsic pressure on the distal portion of the descending colon. There was no respiratory embarrassment.

Three years before admission the patient had suffered an abdominal injury while playing football. He was acutely uncomfortable for several days and finally turned in at the dispensary where he was detained for 3 days. During this period the diagno-

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(1) Shaw, H. K. Epidermoid cyst of spleen. Arch. Surg. 27: 63-74, July 1933.
(2) Radakovich, M. Epidermoid cyst of spleen. Report of case. Am. Surg. 131: 268-276, Feb. 1950.
(3) Epidermoid cyst, belonging to the group
(4) Fowler, R. H. Cystic tumors of spleen. Int. Abst. Surg. 70: 213-223, 1940.

sis of appendicitis was considered The relation of this injury to the condition on admission has not been established but some peritoneal irritation could have resulted from intra abdominal bleeding such as would occur following trauma to the liver or spleen He subsequently recovered completely and had experienced no other episodes of abdominal pain

On physical examination a smooth rounded nontender mass which filled the left upper abdominal quadrant and flaring of the left lower costal margin were noted (fig 1) The mass extended across the midline several centimeters and downward to a point just above the iliac crest It moved with respirations but was not ballotable It did not pulsate The erythrocyte count was

Figure 1 Photographic tomogram protruding in the left upper abdominal quadrant

4 350 000 the hemoglobin was 13 grams the leukocyte count was 8 800 with a normal differential count The prothrombin time was 65 percent The coagulation time (Lee White method) was 3 minutes Bone marrow obtained by sternal puncture contained no abnormal elements and indicated adequate erythropoiesis

Fluoroscopy revealed that the left leaf of the diaphragm was markedly elevated Retrograde pyelography showed inferior displacement of the left kidney in its normal plane by the mass (figs 2 and 3) *It was therefore assumed that the mass was within* the abdominal cavity and did not arise retroperitoneally There was no direct connection between the tumor and the left kidney A gastrointestinal series revealed marked compression of the stomach and duodenum with displacement to the right The duodenal loop was widened The transverse colon and splenic flexure were displaced anteriorly and inferiorly and bore no direct relation to the mass

Figure 2. Anteroposterior pyelogram (no. 8) inferred displacement of the left kidney. The magnitude of displacement of the left kidney is no greater than that lined with arrows (see Fig. 3). Late allopyelogram (no. 9) inferred displacement of the left kidney is no greater than that marked with arrows.

\ laparotomy was performed on 24 March A smooth rounded cystic mass covered by omentum which was adherent over its anterior surface was found Superiorly it was adherent to the left lobe of the liver and to the diaphragm The cyst wall was fibrous and gray white Following the aspiration of 5 000 ml of dark watery fluid mixed with debris from the cyst, a fringe of splenic tissue could be identified along the inferior margin of the mass Splenectomy was performed after freeing the adhesions These adhesions were unusually vascular A transfusion of 500 ml of whole blood was given during the operation

The postoperative course was uneventful The patient was discharged on the fourteenth postoperative day and 2 months later he had no complaints The usual post plenectomy platelet increase did not attain the expected levels probably because of the absence of normal splenic function preoperatively Before operation the platelet count was 195 000 This rose to 280 000 on the first day reached a peak of 640 000 on the eighth day and fell to 220 000 on the fourteenth day

The pathologist reported that the spleen measured 30 by 21 by 4 cm One pole revealed a relatively intact red brown, normal appearing architecture The remainder consisted of an enormous collapsed cyst about 20 cm in diameter The wall varied in thickness from 0 4 to 2 5 cm The external surface showed areas of torn fibrous adhesions and hemorrhagic and yellow gray discoloration The inner lining was composed of a grossly trabeculated membrane which superficially resembled trabeculae carneae In addition, there were numerous small secondary cysts widely distributed throughout many aspects of the wall of the large cyst Most of these contained clear yellow green fluid or blood under great pressure There were many hemorrhagic areas beneath the cyst wall

Microscopic examination of the noncystic pole of the spleen revealed fibrosis and ectasia of the sinusoids There were numerous small cysts lined by pavement and stratified epithelium in some areas The major cyst was lined by low pavement and stratified squamous epithelium Based on these findings a diagnosis of epidermoid cyst of the spleen was made

CONCLUSIONS

The following findings are important in the diagnosis of splenic cysts (1) the presence of a nontender cystic mass in the left upper abdominal quadrant (2) the demonstration by retrograde pyelography of inferior displacement of the left kidney in its normal plane and (3) the anterior and lateral displacement of the stomach and duodenum and the inferior and anterior displacement of the transverse colon

SIMULTANEOUS PERFORATED APPENDICITIS, VIVAX MALARIA, AND ASCARIASIS [1]

WILLIAM F. SMITH, Lieutenant Colonel, MC, U.S. Army
ERIK LARSEN, Captain, MC, U.S. Army

IT is unusual in this country since the end of World War II to see a patient having a simultaneous attack of acute appendicitis, vivax malaria, and ascariasis. Many men are now returning from Korea and because of similar circumstances in which a certain proportion must presumably have acquired all three, we hope that this report may be of value. In the face of the large numbers of troops returning to the United States from Korea and attacks of malaria among them increasing in frequency, reaching a peak of more than 600 per week (1, 2), the unknown but undoubtedly large number of these patients who have ascariasis, malaria, ascariasis and appendicitis may also be associated with acute abdominal pain (3) but only appendicitis (with rare exceptions) warrants operation (4).

CASE REPORT

A 20-year-old man, recently returned from Korea, was admitted to this hospital late in the afternoon of 3rd June 1953. He became ill late in the evening of 2 June while driving from his home in Wyoming and to camp for separation. He complained of nausea, vomiting, generalized chills, and vague abdominal pain. He appeared to be acutely ill and his temperature was 103° F. There was slight tenderness (without rebound tenderness) in his right lower abdominal quadrant. Rectal examination revealed slight tenderness of the anterior rectal wall. Blood smears were negative for malaria and a white blood count showed

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(1) U. S. Army Hospital, Camp Carson, Colo.

(2) Alving, A. S., Arnold, J., and Hockett, D. H.: Studies on primaquine and a therapy of subclinical vivax malaria with primaquine, J. A. M. A., 148: 1, 1952.

(3) Primaquine for vivax malaria, (Editorial) Am. Practitioner and Digest of Treatment, 4: 1, 1953.

(4) Pinello, G., and Serra, E.: Simulation of abdominal acute surgical diseases—especially appendicitis—by malarial attacks (some abdominal symptoms in malaria and their significance), Rev. malariol., 7: 1948. Cited in Trop. Dis. Bull., 46: 1949.

(5) Shaw, R. C., Lanham, F. W., and Wilkerson, C. C.: Spontaneous rupture of spleen in malaria, report of case, J. A. M. A., 140: 1949.

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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense The Chairman of the Armed Forces Medical Policy Council and the Surgeons General of the several services invite all medical officers dental officers Medical Service Corps officers Nurse Corps officers and officers of the Veterinary Corps of the Armed Forces and the medical consultants of the Army Navy and Air Force to submit manuscripts for publication in this *Journal*

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The summary should be a factual and brief recapitulation of the observations or statements contained in the article The conclus ons drawn from the case experiment o facts set fo th should be clearly stated and should a pear at the close

The editor is not responsible for the saf- return of manuscripts and illustrations All material supplied for illustrat on if not original must be accompanied by reference to the ource and a statement that reproduction has been authorized. Recognizable photographs of patients should carry permission to publish

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Monthly Message

Medical research career patterns in the Armed Forces have attained considerable stability since World War II due in large part to the sustained military and civilian interest in and support of general professional achievement Nevertheless certain factors have contributed to the dissuasion of qualified investigative scientists from a career in uniform

One of the major objections that was formerly raised by individuals contemplating a military medical research career was the lack of assurance of an uninterrupted pursuit of research It is also the belief of some that a career in research does not afford equal opportunities for promotion with those of other branches of the service

This entire problem has been one of deep concern to the Armed Forces Medical Policy Council and at their first meeting of the new year they recognized that research is an essential component of the medical activities of the Armed Forces and must be conducted to a substantial degree by those in uniform The Council furthermore stressed that a fundamental factor in the correction of inequities in the research career pattern lies in a recognition of research as a stable requirement over and above the operational personnel needs of the services In the implementation of these factors the Surgeons General have recently taken definite steps to provide stable career patterns for research personnel and to enhance the cause of research in the Armed Forces

Melvin A Casberg

Melvin A Casberg *M D Chairman*
Armed Forces Medical Policy Council
Office of the Secretary of Defense

THE ARMED FORCES MEDICAL POLICY COUNCIL

I Office of the Chairman *(1)*

THE chairman of the Armed Forces Medical Policy Council is appointed by the Secretary of Defense and serves as the principal advisor and assistant to the Secretary on all medical and health matters relating to the Armed Forces He is responsible for coordinating the agenda for Council consideration and serves as the presiding officer as well as a member of the Council He advises the Secretary of Defense of all critical issues under consideration The chairman, in consonance with



Figure 1 Office of the Chairman Armed Forces Medical Policy Council Left to right Colonel Sheldon S B ownton USAF (MC) Executive Officer Melvin A Casberg M D Chairman and Lieutenant Colonel F ank K. Lawford MSC USA Administrative Officer

(1) The fir t of f ur article o th Armed For es Medi al Pol cy Council

views of the Council, represents or arranges for representation of the Department of Defense before and with other governmental departments and agencies on all matters for which the Council has responsibility He directs supervises and controls the staff of the Council and establishes such continuing and tem porary committees as may be necessary in carrying out the re sponsibilities of his office

Serving as immediate assistants to the chairman are the ex ecutive officer and the administrative officer who are responsible for organization management personnel and administration of the Council (fig 1) In administering the office of the Armed Forces Medical Policy Council they develop estimates of per sonnel and other support required to carry out the Council approved programs They coordinate, assemble and distribute the agenda for Council meetings and maintain records of such meetings following through on actions and policies approved by the Council A policy register which contains all approved De partment of Defense policies on medical and health matters is maintained by this office At the termination of each fiscal year a comprehensive annual report which receives wide distribution among military installations as well as numerous civilian medical groups, is prepared Concise information on Council activities which is included in the semiannual reports of the Secretary of Defense is also furnished In addition to other public relations activities with professional journals and civilian medical agen cies the executive officer and administrative officer arrange for prominent civilians in medicine and allied fields to attend as guests regular meetings of the Council

Citation for MATS

On 21 January 1953 a Citation of Honor was presented to the Military Air Transport Service (MATS) by the National Foundation for Infantile Paralysis in recognition of MATS co-operation during the preceding 2 years in transferring patients with polio myelitis for treatment and in flying essential equipment into epidemic areas during emergencies The citation was made on the occasion of the MATS hundredth transfer of such patients for the Foundation

THE EPIDEMIOLOGY OF INFECTIOUS HEPATITIS[1]

WILLARD R WARREN *Captain, MC USA [2]*

SINCE 1629, when the first epidemic of infectious hepatitis to be reported occurred in Spa, this disease has assumed vast importance as a sporadic and epidemic disease of man with a perverse fondness for military populations. In the European campaigns of the latter half of the eighteenth century, outbreaks of hepatitis became common among troops, and many more military epidemics were reported in the following century During the Civil War alone 72,000 cases of jaundice were said to have occurred. In World War I the disease first appeared among British troops in Alexandria in 1915, and thereafter broke out in all armies on all fronts, often with a startling morbidity and a corresponding loss in military effectiveness The magnitude of the problem which this disease presented to the Armed Forces in World War II is well illustrated by the American experience in the Mediterranean Theater, where between 1 January 1943 and 31 March 1945, 35,000 cases occurred *(3)* This represented a loss in manpower equivalent to nearly 2 infantry divisions

The prevention and control of infectious hepatitis are matters of first importance from a purely military point of view Preventive measures must be based on an intimate knowledge of the epidemiology of the disease and, in particular, of its precise mode or modes of spread. Current information on this subject is fragmentary, although marked advances have been made in recent years and reasonably well supported epidemiologic theories have been adduced Progress in this field has been hampered, however, by inability (1) to isolate the infective agent and follow its transmission by inoculating animals and (2) to examine the aspects of immunity in the population by skin tests or serologic

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(1) Thi tudy i concerned only w th th naturally occurring form of th disea e with n incubati n period of bout 30 day ins far s t i possible to disti guish th s fr m erum h p titis

(2) Walter Reed Army H spital W hingt n D C. formerly Chief of Prev ntive Medi cin Secti Office of th Surgeo Berlin Command Offic Military Government United States.

(3) Gauld, R L Ep d miol gical field studi s of infectio hep titis in the Medi terra ea Theat r of Operations clinical syndr me mo bidity mortality sea onal incr- den Am J Hyg 43 248-254 M y 1946.

examination *(4)* An attempt is made herein to evaluate recent experience with the epidemiology of hepatitis as described in reports of outbreaks in the past 15 years and to present certain personal observations on the transmission of the disease in a military community

REVIEW OF THE LITERATURE

The medical literature of the past 15 years is summarized in table 1 The following modes of spread were suggested (1) respiratory or droplet transmission (2) unspecified contact transmission (3) intestinal-oral or enteric transmission and (4) indeterminate

Respiratory or droplet transmission was suggested in 12 reports Lisney *(5)* Newman *(6)* Nicol *(7)* Edwards *(8)* Ford *(9)* and Hardy and Feemster *(10)* reported outbreaks in which case-to case transmission as a result of close personal contact was a prominent feature Serial transmission at intervals of about 30 days and infections of one or more members of a household were frequently observed In most instances spread of the disease by means of water milk food insect vectors poor sanitation, or fomites was thought to have been ruled out. Ford however pointed out that respiratory transmission was not definitely proved and that dissemination could have occurred by means of fecal contamination of fingers.

Cullinan *(11)* reviewed 23 outbreaks Because of the frequency of case-to-case transmission especially in families and dormitories he considered spread by droplet infection to be likely Van Rooyen and Gordon *(12)* reported an epidemic among British troops in the Mediterranean area in which droplet infection seemed to be the mode of transmission They noted however that the peak incidence of hepatitis followed that of dysentery by about 1

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(4) Ry g E Ep d m l gy f nfect h pa ti l da d by udi morb dity A ta m d Sc dina ., pp 234 pp 290-298 1949

(5) L ey A A Ep d m f tar hal j und hool h ldren B t M J 1 703-706 Ap 3 1937

(6) N wman J L Inf ti hep t t h t ry f tbreak in La t V lley Brit M J I 61-65 J 17 1942

(7) N I C G Ep d m c cata hal j und D M J I 466 Ap 11 1942

(8) Edward L R L Outbreak f p d mi tar hal j und B t M J 1 474 475 Apr 17 1943

(9) Ford J C. Inf h pat ti 300 ca in t L d bo gh L t 1 675-678 M y 29 1943

(10) Hardy H L d F m R F Inf cti h patit Ma h tt with ev w f pr ent kn wledg New E gla d J Med 235 147 157 A g 1 1946.

(11) Cull na E R Ep d mi l gy f j und P c Roy So M d 32 933-950 Jun 1939

(12) V Rooyen C. E d Gord J Som per mental w k on fecti e hep t in W E. F J Roy A my M Corp 79 213 225 N 1942

TABLE 1 *Summary of literature of past 15 years*

Author	Population or location	Number of cases	Period	Mode of transmission
Gauld (3)	Military	35 000	1 January 1943 to 31 March 1945	Respiratory and enteric
Lisney (5)	Leicestershire (students)	40	–	Droplet
Newman (6)	Rural	33	–	Air-borne
Nicol (7)	Yorkshire	12	2 months	Droplet
Edward (8)	Urban	64	8 months	Droplet
Ford (9)	Suburba	300	–	Droplet
Hardy and Feemster (10)	Massachusetts	151	1945	Droplet
Cullinan (11)	England	1,900	1926 to 1939	Droplet
Van Rooyen and Gordon (12)	Military	–	–	Droplet
Dixon (13)	Military	–	1938 to 1942	Droplet
Lisney et al (14)	Leicestershire	1 017	1936 to 1943	Droplet
Getty (15)	Military	241	18 August to 8 November 1944	Respiratory
Sergeant (16)	Students	44	January to September 1937	Contact
Martland and Wanner (17)	Hospital	4	19 to 26 July 1939	Contact (?)
Slander (18)	Urban and rural	–	–	Contact
Kligl et al (19)	Camp	491	1 July 1942 to 31 March 1943	Contact
Cookson (20)	Gloucestershire	246	1943	Contact
Somerville and Clark (21)	Urban	74	2 years	Contact
McFarlan (22)	Military	–	–	Contact
Davis and Hanlon (23)	Urban	276	1 September 1944 to 1 June 1945	Contact (Enteric or respiratory?)
Pearce (24)	Student	11	2½ months	Contact
McLeod (25)	Institution	100	13 months	Contact
Paul and Gardner (26)	Military	–	1946 to 1950	Contact
Menon (27)	Family	2	14 January to 27 February 1951	Contact
MacCallum et al (28)	East Anglia	–	1943 to 1947	Contact

TABLE 1 *Summary l l terature of past 15 year — Co d*

A h r	P pul t foc	N mbe f	P od	Mod f tr m
Ge on *(29)*	Military	73	Sept mbe t November 1943	En t
W lk *(30)*	Mil t ry	–	Summer and f ll 1943	En t
Ba k t l *(31)*	Military	1 172	F bruary t N mbe 1944	E ter
E *(32)*	Hospital	65	Wi 1941 nd apr g 1942	Ent
Gow *(33)*	Mil t ry	400	5 mo h	En
Kunk l d Hongla d *(34)*	F mily	9	5 m h	En
Capps t *(35 36, 37)*	Nurs	73	7 y	E
Spooner *(38)*	Mil tary	–	–	Fly-bor
Kurk *(39)*	M l tary	1 059	–	Fly-bor
V Rooy nd K k *(40)*	Mil tary	2 095	A gu t 1942 t J uary 1943	Fly-bor
T us ll *(41)*	Mil tary	100	–	Fly-bo
Read l *(42)*	Stud t	24	26 May 5 Jun 1944	Food bo
Murphy l *(43)*	Urba	10	21 May to 28 J 1945	Milk-bor
Dohmen *(44)*	M l tary	84	A gus o N mbe 1940	W r-bor
Haller *(45 46)*	V ou	–	–	W r-bor d nt c
Neef nd Stok *(47)*	Camp	350	13 w k	W t r-bor
H ywa d *(48)*	Urba	52	Oct be 1945 t Apr l 1946	W t bo
Rab *(49)*	U ba (m l tary)	31 N vember d Decembe 1946		W ter bor
Pott *(50)*	Mil tary	6	1 Apr l to 30 Sep mber 1947	W -bor
Harris *(51)*	Mil tary	100	27 March to 17 Apr l 1945	W er-bor e
Of *(5)*	Hot l	34	July 1944 to April 1945	W -bor e

TABLE 1 *Summary of literature of past 15 years*—Continued

Author	Population or location	Number of cases	Period	Mode of transmissio
von Bormann et l *(53)*	Urban and rural	–	–	Indeterminate
Cr e a d Brown *(54)*	Urban and rural	199	–	Indeterminate
Lys *(55)*	Urban	614	June 1942 to May 1943	Ldet rminate
McKinlay and Truelove *(58)*	Military	–	1944	Indeterminate
Ipsen *(60)*	Denmark	–	1943 to 1947	Indeterminate
R werts *(62)*	Fam ly	8	2 months	Indeterminat
Wolff and T usch *(63)*	Saar	–	1948	Indeterminate (nteric?)
J cobi a d Mertens *(64)*	Urban	–	1944 to 1950	Indet rminate
Gowen *(61)*	Military	–	Winter 1944 nd pring 1945	Indeterminate
Alsted *(59)*	D nmark	–	1944 to 1948	Indeterm nate
Bjé neboe *(57)*	Scand na ia	–	–	Indeterminate
Ryssi g *(4 56)*	Urban	–	–	Ind terminat

month in many areas Dixon *(13)* described the experience with hepatitis in Malta and concluded that the disease was spread by droplets in spite of the observation of a definite parallelism with gastrointestinal infections which preceded the outbreaks of jaundice by about 1 month. Lisney *(14)* reported 5 winter epidemics of hepatitis in which serial transmission was a promi nent feature, and in which spread seemed to the author to be by droplet infection No evidence for transmission by water, food, or vermin was found

Getty *(15)* reported an epidemic of hepatitis in a division newly removed from combat in the South Pacific. Twenty five of the 241 cases occurred in a unit which had been on shipboard at the time of probable infection with the virus, and because enteric, food borne, and water-borne transmission were considered

(13) Dixon H B F Notes on infective hepatitis in Malta 1938 1942 J Roy Army M Corps 82 44 48 Jan 1944.

(14) L sney A A. Ford, J C. N wman J L. nd Dav E.. Discussion on infective h patiti rec nt f eld nvest gat ns Proc. R y Soc Med 37 165 171 F b. 1944

(15) Getty R W Epidemiologic study of ep demic hepatitis U S Nav M. Bull. 46 541 553 Apr 1946

unlikely on a naval vessel, it was concluded that spread was probably by the respiratory route This same unit, however had spent much time in and about Japanese native villages where sanitation was poor and conditions for acquiring filth borne diseases were ideal It had the highest incidence of hepatitis of any component of the division Gauld *(3)* studied the epidemiologic experience with hepatitis in the Mediterranean Theater in World War II and concluded that the disease is usually spread by person to person contact via the respiratory or enteric routes, generally the former As evidence in support of the respiratory theory of transmission he cited epidemics in which the case distribution conformed to sleeping quarters and the fact that the incidence of hepatitis was higher in headquarters companies than in combat units in the 1943 1944 outbreak. The statistics quoted for the 1944 1945 outbreak however tend to vitiate the latter argument for they show a higher incidence in combat companies than in headquarters troops.

Unspecified contact transmission Thirteen reports fell into this category Several outbreaks occurring variously in camps army units hospital personnel towns and provinces were reported *(16–24)* Case-to-case transmission as a result of close personal contact was common to all of these outbreaks Multiple cases in families and serial transmission at intervals of about 30 days were frequently noted In most instances there seemed to be no relationship with enteric or respiratory disease and dissemination by water milk or food was ruled out Most of the authors believed that droplet transmission was unlikely, though Somerville and Clark *(21)* suggested it as a possibility Gaps in the chain of transmission were often observed and Cookson *(20)* suggested carriers or subclinical cases as an

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(16) S gen B Epidem catarrhal j und i hool hildr Brit M J 2 703 Oct 9 1937

(17) M la d E M od W ner A L Epidem c j und h p tal ou br k L nc 1 761 163 J n. 21 1939

(18) S l der P Epid mi ch d porad s h lk tat h p d m olog h und kl h U uch ng A ta pa dis (pp 4) 23 3 251 1939

(19) Kl gler I. J B h D S. od Koch W Ob rva ion 2 p d m f fec hep P l u m g ecent mm gra t J Inf t. Di 74 234 246, May-Jun 1944

(20) Cook on J S. Epid m i f ct h pa Gl uc t hir B t. M. J 1 687-68) M y 20 1944

(21) Somer ll A., nd Cla k J S. Epid m c j d Canad M A J 51 120-123 A 8 1944

(22) McF la A M Epidemi logy f infec h pa m un t f B h Army in Sic ly nd Great Br ta n 1943 1944 Quart J Med 14 125 146 J ly 1945

(23) Dr D J nd H nlon R. C. *Epidem inf c ou h pa t i m ll* J wa c mm nity Am J Hyg 43 314-325 May 1946

(24) Pear H E Outbr k f inf h pat s in rur l chool Stanford M Bull 6 444 1948

explanation of these McLeod *(25)* reported an outbreak of hepatitis in an institution for the feeble-minded, wherein the incidence of the disease increased in direct proportion to the degree of mental deficiency This was interpreted as evidence favoring contact transmission

Paul and Gardner *(26)* reviewed the American experience with hepatitis in postwar Germany and concluded that most cases were acquired "as a result of direct personal contact with German people or in German households" They found no relationship between the hepatitis curve and that of respiratory disease, pneumonia, mumps, dysentery, or diarrhea There was some circumstantial evidence for parenteral transmission of the disease Meenan *(27)* reported an unusual case in which hepatitis was apparently acquired by kissing MacCallum et al *(28)* described the results of studies on the epidemiology of hepatitis in East Anglia which pointed to spread of the disease through contact Field investigations there disclosed a mode of transmission similar to that of poliomyelitis Water and food borne epidemics were said to be unusual

Intestinal oral or enteric transmission The 24 articles reporting outbreaks which belong in this category may be further classified according to the type of enteric transmission found

1 *Miscellaneous* Gezon *(29)* reported an epidemic of hepatitis in a military unit in Tunisia. Dysentery had been prevalent during the preceding 6 months, though a history of diarrhea was no more common in the patients with hepatitis than in a control group Walker *(30)* described an epidemic in U S troops in North Africa which had been preceded by a high incidence of dysentery about a month earlier Contact spread was not a common feature, but there did seem to be an association of the disease with insect ridden areas Barker et al *(31)* studied over 1,000 unselected cases occurring in the Mediterranean Theater and concluded that spread of the disease was chiefly by the enteric route

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(25) McLeod K W Epidemic of common infectious jaundice J Pediat. 24. 454 469 Apr 1944

(26) Paul J R. and Gardner H T.. Symposium on viral hepatitis endemiologic aspect of hepatitis in U S troops in Germany 1946-1950 Am. J Med. 8: 565-580 May 1950

(27) Meenan P N Late activity in hepatitis Lancet 1 447 448 Feb 24 1951

(28) MacCallum, F O. et al Infective hepatitis studies in East Anglia during the period 1943 1947 Spec Rep Ser Med Res Coun. London 273 1951

(29) Gezon H M. Investigation of a jaundice epidemic in Tunisia preliminary report. U S Nav M. Bull 43 579-589 Sept 1944

(30) Walker D W Some epidemiological aspects of infectious hepatitis in U S Army Am J Trop Med 25 75 82 Mar 1945

(31) Barker M H Capps R. B and Allen F W Acute infectious hepatitis in Mediterranean theater including acute hepatitis without jaundice J A M. A 128 997 1003 Aug 4 1945

2 *Contact* Evans *(32)* reported an epidemic of 65 cases in which case-to case transmission was usually demonstrable He noted that nurses were frequently infected by patients but patients rarely by other patients and interpreted this as evidence that feces or urine serve as vectors Gowen *(33)* described a large outbreak of hepatitis among U S troops in Tunisia. Although a history of contact was rarely obtained he concluded that the disease was probably spread by personal contact via the enteric route. He observed a high incidence of nonicteric cases (ratio to icteric cases was 8 1) and this finding doubtless explains the infrequency of a history of contact with a jaundiced person Many other investigators have commented on the importance of nonicteric or subclinical cases in the dissemination of viral hepatitis Hunkel and Hoagland *(34)* reported an outbreak involving 9 of 10 children in a family living under very crowded conditions Contact spread by fecal contamination was considered to be the mode of transmission Capps et al *(35–37)* recorded an epidemic among student nurses working in an orphanage. Most of these patients were assigned to a certain floor where one third of the children were subsequently found to have abnormal liver function tests The nursing technics in use were extremely poor When these were corrected even though respiratory precautions were not instituted the outbreak among the nurses ceased The disease was thought to have been spread from the children (acting as a reservoir of the virus) to the nurses via the intestinal-oral route.

3 *Poor sanitation and flies* Spooner *(38)* Kirk *(39)* and Van Rooyen and Kirk *(40)* described a large outbreak of hepatitis among the British troops on the Alamein Line Most of the cases occurred in units engaged in an area 5 miles square which had recently been evacuated by the enemy who was known to have

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(32) E P Comm s p d m f hepa is B M J 2 446-449 Oct 17 1942

(33) Gow G. H. Epid m l gy f p d m h pat t B ll U S. Army M. Dept (No. 84) 41 50 J a. 1945

(34) Kunk l H. G ad Hoagla d, C. L. Obs va i as f mily ep d mi f infe t c h pa s. N w E gland J Med. 236 891 897 Jun 12 1947

(35) Capps R. B Be ne A. M. nd S k J J P l g d o br k f fec h pa in ur d t group f mall h ldr g rv f ur J Cl a. Inv 29 802 803 Jun 1950

(36) Capps R B Benn A M. nd S k J J Epid m f i us h pa t inf a orphanag p dem ol g tud a nden ur Ar h I M d 89 6 J a 1952

(37) Capp R B nd S k J J Ep d miology f fe h patiu d pr blem f pre tion nd u l J A M. A 149 557 561 J 7 1952

(38) Spoone E. T C. Th 1942 pid m f inf hepat t i M ddl Eas P oc Roy Soc M d. 37 171 172 F b. 1944

(39) Kirk R Spread of f h pati La 1 80-81 J 20 1945

(40) V Rooyen, C. E. nd K k, G R Spr d of nfec ve h pa d pol omy T Egypt (I oyma C ll p l ur) Edi b gh M. J 53 529-543 Oc 1946.

had a high incidence of hepatitis Here fecal contamination was widespread, unburied corpses were everywhere, and flies were plentiful In other areas where fly control was good, the incidence of hepatitis was low The several authors concluded that in this particular epidemic the disease was primarily fly-borne Trussell *(41)* reported a military epidemic in New Guinea occurring in a region where sanitation was poor Open trench latrines were in use, mess halls were unscreened, cooking and eating utensils were improperly cleaned, flies were numerous, and conditions in general were most favorable for the spread of any enteric disease Diarrhea and dysentery were rampant. About 1 month after the institution of proper sanitation, however, the epidemic of hepatitis died out. Here again we seem to be dealing with a fly borne epidemic

4 *Food and milk borne* Read et al *(42)* reported an epidemic involving 26 medical students, all of whom were members of a single fraternity and who ate most of their meals at the fra ternity house No cases occurred among members who ate few or no meals at the house The authors concluded that the epidemic was probably food borne, though the food involved or the mech anism of contamination could not be demonstrated Murphy et al *(43)* described an outbreak among the customers of a rural dairy Investigation revealed the dairy to be grossly insanitary, with ample opportunity for fecal contamination of the milk Moreover, 2 cases of hepatitis had occurred in members of the dairyman's family about a month before the outbreak The authors believed that circumstantial evidence pointed to milk as the medium of transmission of the disease

5 *Water-borne* Dohmen *(44)* reported an outbreak of hepatitis in a German army unit occurring about 1 month after exposure to a badly contaminated water supply at a school in Paris where the troops had been temporarily billeted. The same water supply had been the vehicle of transmission of an earlier epidemic of bacillary dysentery Hallgren *(45, 46)* described 7 epidemics of hepatitis occurring in communities, institutions, and families.

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(41) T ussell, R E. Epidemiolog c aspects of o tbreak of nf ctious h patitis Am J Hyg 45 33 42 J n 1947

(42) R d M. R. Bancroft H. Doull J A and P rker R. F Inf ctious h patiti — pr umably food bor o tbre k Am J Pub Health 36 367 370 Apr 1946

(43) Murphy W J Petr e L. M. and Work S D Jr Outbreak of inf ctious h patitis ppa e tly milk borne Am J Pub. H alth 36 169-173 F b. 1946

(44) D hm n, A Klinische und pidem logisch Be bachtungen bei gehäuftem A fretenvo H patiti epid mic Deut Militära t 6 532 1941

(45) H llg en R Ep demic of hepat ti in ounty f V sterbotten in n rthern Sweden. I A ta med Sc ndinav supp 140 1 1943 Bull Hyg 19 506-507 July 1944 (Abstract).

(46) Hallgr n R Ep d mic of hepatitis in co nty of V sterbotten in northern Sweden II Acta med Sc ndinav 115 23 1943 Bull Hyg 19 506-507 July 1944 (Abstract)

In 3 of these transmission was apparently by contact and in the remainder the disease seemed to be water-borne In all of the latter the sources of water supply were unsatisfactory and bacteriologic examinations disclosed high counts of *Escherichia coli* In 3 of these the epidemic subsided about 1 month following the institution of adequate water purification

Neefe and Stokes *(47)* investigated a large epidemic at a summer camp in which water from a certain well seemed to be the medium of transmission of the disease. This well had apparently been contaminated by a nearby cesspool which received the excreta of the first patients in the outbreak Water from the well caused hepatic dysfunction in 4 of 5 human volunteers who ingested it. Hayward *(48)* reported a municipal epidemic in which case distribution corresponded to the course of the city s principal water mains The water supply was derived from a river which was frequently contaminated by raw sewage at a point near the intake site of the water supply system It seems likely that the drinking water transmitted the disease in spite of the fact that it was chlorinated and subjected to the other usually adequate forms of treatment.

Rabe *(49)* recorded an epidemic occurring in the American population of a German city About 1 month before the outbreak the water supply—the sources of which were unsatisfactory and the treatment of which was inadequate—was frequently found to be contaminated with *E coli* and diarrhea was prevalent among both the American and the German populations Circumstantial evidence thus suggested water borne transmission Potts *(50)* described an outbreak in 2 ordnance units in which most of the patients had drunk heavily contaminated water intended for industrial rather than drinking purposes This water was derived from a stream which received the raw sewage from 4 German communities Other members of the same units who had not been exposed to the contaminated water did not develop hepatitis. Harrison *(51)* reported an epidemic in an infantry battalion in which most of the patients were members of 2 companies which had obtained drinking water from a poorly constructed and heavily contaminated well

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(47) N f J R. nd S k J J Ep d m f nf ious h pati ppa dy d t wa er bor g t pidemi l g bserva nd tr nsmis on pe me t i h ma lan er J A M. A 128 1063-1075 A g. 11 1945

(48) Hayw d M L. Ep d mi l g l rudy of br k of inf ctious h patiu Ge roe l ry 6 504-510 Jan 1946.

(49) Rabe E F Epidemi of inf us h pat tis M Bull Theater Chi f Surgeon European Theater (No. 3) 2 2 14 Ma 1947

(50) Pot C. E J Ou break f nf t h pa M. Bull Ch f Surg on Eur pea Comma d (N 4) 4 2 10 De 1947

(51) Ha ri on, F F.. Inf ous h pa tis r port of ou bre k ppa ly w r-born Ar E In Med 79 622-625 Jun 1947

Olin *(52)* recorded an outbreak occurring in a hotel which obtained its water supply from a small lake Sewage from the hotel emptied into the same lake at a point about 60 meters from the water inlet. The drinking water was inadequately treated and was frequently found to be contaminated with coliform organ isms Water-borne transmission of the disease was considered likely In several of the above-mentioned reports the occurrence of a few secondary cases in which transmission was apparently by means other than water was described.

Indeterminate Thirteen reports fell into this category von Bormann et al *(53)* investigated epidemics of hepatitis in 6 German villages but reached no definite conclusions as to the mode of spread of the disease He did note, however, an associa tion of a high attack rate with a history of close contact in school or home Cree and Brown *(54)*, describing their experience with hepatitis in 2 areas in Wisconsin, observed that in both of these districts conditions were favorable for air borne, contact, and water borne transmission, but that evidence obtained did not lend conclusive support to any of the currently held theories as to the dissemination of the disease They suggested that other possible means of transmission should be explored Lys *(55)* reported a large epidemic in Basel but did not speculate as to the precise mode of spread Many features suggested a contact type of infection, however Ryssing *(4)* studied the epidemiology of hepatitis in Denmark and found a striking similarity between its characteristic morbidity and that of poliomyelitis He con cluded that the 2 diseases are probably transmitted in a similar fashion Several other investigators have commented on the resemblances in the epidemiology of these 2 diseases *(28 40, 56 57)* McKinlay and Truelove *(58)* described the experience with hepatitis in certain allied troops in Italy Although they reached no conclusions as to the mode of spread, they found

(52) Olin G H pat us ep demic presumably spread by wat r Acta med Scandinav s pp 196 pp 381 391 1947

(53) v n Bormann F Bad R E De H. nd Unholtz K Hepatitus epid mica in Deuts hland B itrage z Hyg u. Ep d m 1 9 1943 Bull Hyg 19 921 Dec 1944 (Absu t)

(54) Cr e E M nd Brown J W Observations on ep demiology of infectious hepatiti J Lab & Clin. Med 37 104 121 Jan. 1951

(55) Ly J D Hepatiti pidemica in Basel 1941 1943 Gesundh it u. Wohlfahrt 24 170 1944 Bull Hyg 19 673 Sept 1944 (Abstract)

(56) Ry ng E Hepatitis in Copenhagen On cause of fr que cy f chronic hepatitis dur g p d mic in the forti Acta m d Scandinav (upp 239) 138 66 77 1950

(57) Bjørneboe M On var ati ns in frequency of cute hepatitis application of H lg P t rsen s th ories to ep d mic curve for hepatitis Acta med Scandinav (supp 206) 386 389 1948

(58) M Kinlay P L nd Tr elov S C Epidemiology of nfectiv hepatitis among Alli d troop in Italy Brit. J Social M d 1 33-50 Jan 1947

no evidence of droplet transmission. Alsted *(59)* Ispen *(60)* and Ryssing *(56)* discussed recent observations on hepatitis in Denmark but did not establish the means of transmission involved Gowen *(61)* Rewerts *(62)* Wolff and Teusch *(63)* and Jacobi and Mertens *(64)* also reported outbreaks in which the method of spread was not clearly established though valuable observations on the epidemiologic behavior of the disease were made.

Comment On the basis of the above observations the following conclusions seem justifiable

1 Acute infectious hepatitis can be and most frequently is, spread by personal contact between a susceptible person and one with an overt or subclinical infection

2 There is little or no tangible evidence that this contact type of infection is mediated by respiratory droplets or that the respiratory route is in any way involved in the transmission of the disease. In most of the hitherto reported epidemics in which the respiratory or droplet routes have been incriminated, transmission could be equally well or better explained on the basis of intestinal oral infection by means of contact For practical purposes it would seem expedient to dismiss the respiratory theory as unlikely, if not disproved.

3. There is on the other hand a large body of epidemiologic evidence to support the theory that infectious hepatitis is transmitted via the enteric route. Indeed hepatitis may properly be looked on as a primarily enteric disease which may be transmitted not only by contact but also by water milk food, flies and presumably fomites Moreover the enteric theory is thoroughly in keeping with the abundant experimental work which has demonstrated conclusively that the infectious agent is present in the stools of patients and that the disease can be transmitted to man by the feeding of infected feces

4 From the point of view of preventive medicine therefore it would seem that outbreaks of hepatitis should be managed with the measures appropriate for the investigation and control of any enteric disease.

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(59) Al ed G. Ou be k f mal gnu h pa u Acta med Sc nd na (pp. 206) 136 357 375 1948.

(60) Ip J J (Bo oo) Ep d m f Inf us h pat pred m nu ly f d l and k ghly f tal for ldc ly women. Am J Hyg 51 255-263 Ma 1950

(61) Gow n, G H Obs rv i ns on nf ctio h pa Seventh Army 1944 45 Bull U S Army M. Dep 6 456-461 Oct. 1946

(62) R wert G Zur Ep d miol g der H patit p d mic De ts h m d W h h 75 805-806, Jun 9 1950

(63) Wolff L. (Sua bruck) d T usch W Lebe d h pat t ep d mics Med Mons s h 3 660-665 Sept 1949

(64) J c b J nd Mertc E. H pati isfragen. De sch med W h sch 75 1325-1327 Oc 6 1950.

REPORT OF AN OUTBREAK

From the earliest days of the Occupation in Germany the hepatitis rate for American troops stationed in Berlin exceeded by a large margin that of the European Command as a whole, which in turn was much higher than the rate for troops stationed in the United States (fig 1) In the winter of 1947 1948, an investigation was carried out by the Preventive Medicine Section of the Berlin Command Surgeon s Office in an effort to ascertain

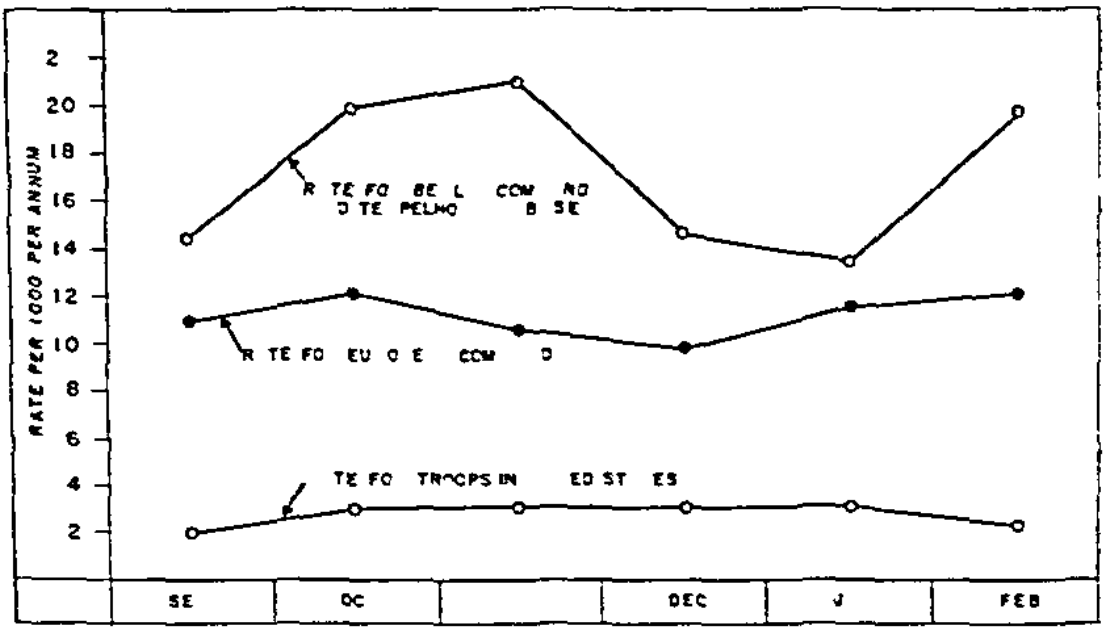


Figure 1 Comparison of hepatitis rates from September 1947 through February 1948.

the causes of this phenomenon. The period from September 1947 through February 1948 was chosen as the area for study because it corresponded with the seasons of highest incidence of the disease During this period 52 members of the command (the population of which numbered about 6,000) acquired hepatitis These were scattered throughout the various units of the post, with no remarkable localization as to time or place (table 2) On each of these patients a careful questionnaire which furnished data for a portion of this study was prepared

In accordance with the current theories as to the mode of transmission of hepatitis, the following possibilities were systematically investigated to determine which of them might be applicable to the situation in Berlin (1) contact transmission, (2) transmission by means of blood derivatives or contaminated syringes, (3) respiratory or droplet infection, (4) carrier transmission, (5) water-borne infection, and (6) food borne infection The findings in each of these categories are presented below

Contact transmission Only 14 of the 52 patients (27 percent) had a history of recent contact with a jaundiced person In 7 of

these the contact had been frequent or intimate while in the remainder it had been casual or rare In comparison with many other reported epidemics, a history of contact in the present study was infrequent. This may be interpreted as indicating either that many patients acquired the disease as a result of contact with a person having a subclinical infection or a carrier or that contact transmission played a small part in spreading the disease in this community

TABLE 2 *Incide e f hep t t s th princ p l tr p compound f th B lm Command from Sept mbe 1947 thro gh F bruary 1948*

Comp d	M n str gth	N mbe of pati t	R te pe 1 000 pe y r
P rtoa Barra ks	831	5	12 03
Roo lt Barra k	1350	18	26 67
M N ir B rr ck	1215	7	11 52
Andr w Barr cks		0	0
279th Station H p tal	392	3	15 31
7782d Spe ial T oop	770	1	2 59
T mpelh f Air B s	667	7	20 99

Transmission by blood or contaminated syringe Only 1 of the 52 patients gave a history of having had an infusion of plasma and the time that had elapsed since its administration exceeded the upper limits of the incubation period of homologous serum jaundice None of the patients had had a transfusion of whole blood 42 (80 7 percent) had had blood drawn for tests in the recent past and 18 (34 6 percent) had been treated for venereal disease In view of the high incidence of venereal disease in the command and the fact that a serologic survey of all military personnel was in progress during the period these high percentages are not necessarily significant. It is likely that the population as a whole would have shown a similar percent who had had recent venipunctures though unfortunately a control study was not made Moreover during the period of study it was the practice in accordance with current Army directives to use a freshly sterilized needle or syringe for each parenteral injection or venipuncture Thus it seems unlikely that transmission by contaminated needles or syringes played a significant role in this outbreak though the possibility cannot be excluded.

Respiratory or droplet infection A comparison between the incidence curves for hepatitis and the common respiratory diseases during the period of study is shown in figure 2 No apparent relationship exists between the two Throughout most

of the period the incidence of respiratory disease in Berlin was uncommonly low—lower than that of the European Command as a whole—whereas the incidence of hepatitis was high, exceeding that of the European Command These facts would seem to indicate that in this particular community hepatitis was probably not a respiratory or droplet transmitted disease

Carrier transmission Although the existence of hepatitis carriers has never been proved, there has been good cause to suspect their presence in a number of reported epidemics It therefore seemed worth while to investigate this possibility in Berlin Because carriers working as food handlers have often been incriminated in the dissemination of enteric and other diseases, the latter element of the population was selected for screening

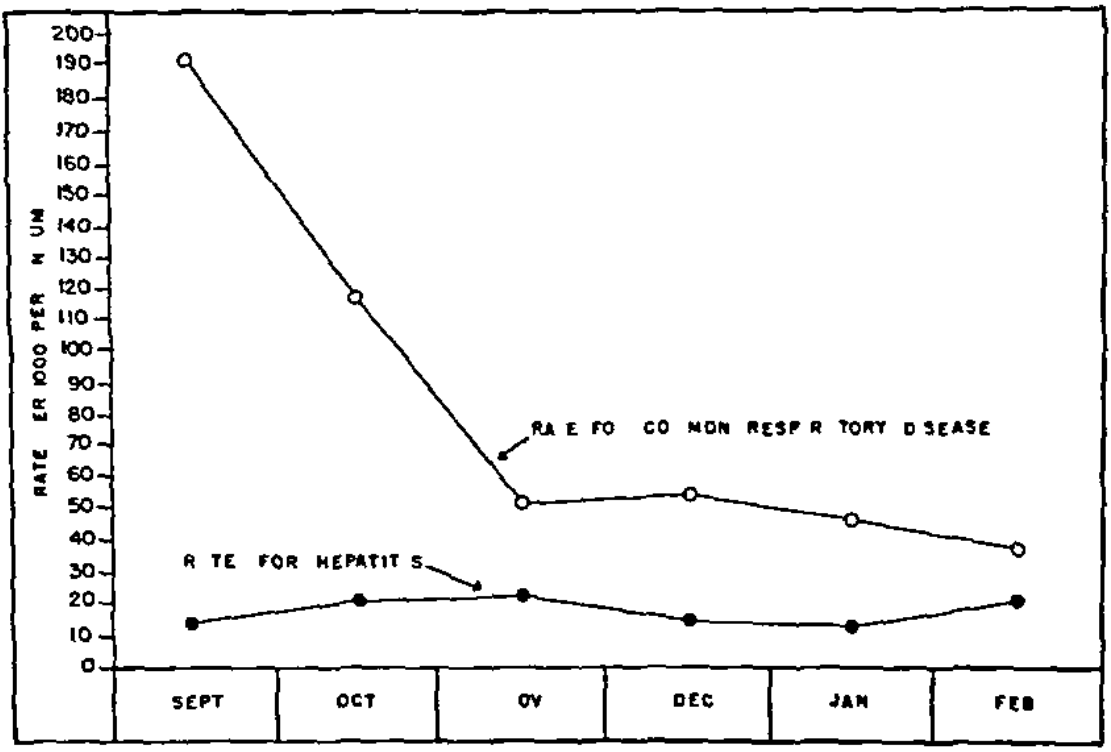


Figure 2 Comparison of rates for the common respiratory diseases and hepatitis from September 1947 through February 1948

Because Roosevelt Barracks, with a rate of 26 67 per 1,000 per annum, had the highest incidence of hepatitis of any of the several military compounds in the American Sector, the food handlers of this installation were chosen for study Both the military and the German civilian mess personnel working in the kitchens and dining rooms of this barracks, were individually interviewed regarding a past history of hepatitis and present symptoms compatible with hepatic disease. Of the 51 military food handlers, 7 had a history of jaundice and another 7 admitted having symptoms suggestive of hepatic disease, such as dyspepsia,

intolerance for fatty foods and episodes of acholia Three of the men with a history of jaundice also had symptoms strongly suggestive of continuing hepatic dysfunction Of the 52 German food handlers 8 gave a history of jaundice, and 2 had suggestive symptoms One of these had previously had jaundice Thus using these rather crude criteria, 23 carrier suspects were dis covered among 103 food handlers

The 14 military food handlers with gastrointestinal symptoms or a history of jaundice were then studied in greater detail On each a more complete history a physical examination a cephalin cholesterol flocculation test and a bromsulphalein test were obtained Three were found to have had infectious hepatitis in the past year 2 of them in November 1947 The 4 others had had the disease in 1946, 1945 1943 and childhood respectively With the exception of 1, all had had uneventful recoveries Two of the group had been exposed to hepatitis in November 1947, but had not themselves developed jaundice Only 1 patient had positive physical findings he had had hepatitis in November 1947 and still had many gastrointestinal symptoms His cephalin cholesterol flocculation and bromsulphalein tests were also positive and he was subsequently readmitted to the hospital with recurrent hepatitis In 2 other patients positive cephalin cholesterol flocculations were obtained without other evidence of hepatic disease In all other instances the examinations were negative Thus of the whole group of military carrier suspects only 1 had unequivocal evidence of hepatic disease though 4 others might reasonably remain under suspicion as carriers because of a recent attack of jaundice or exposure to the disease

Next a comparison was made between the incidence of hepa titis in the 10 companies stationed at Roosevelt Barracks and the presence of suspected carriers in the messes of these com panies No correlation was found to exist between the two Neither was there any concentration of cases in those companies served by the 5 military food handlers who came under the highest *suspicion as carriers Finally in order to determine whether* or not conditions in the kitchens would be favorable for the transmission of an enteric disease should carriers be present bacteriologic cultures were obtained from various kitchen utensils in 5 of the messes 60 percent of these were positive for coliform organisms indicating rather widespread fecal contamination

In summary this study adduced no evidence that carriers who were food handlers played any part in the dissemination of hepatitis in this community in spite of the rather large number of food handlers who might reasonably be suspected of being carriers and the favorable conditions in the messes for carrier transmission of an enteric disease

Water borne infection The water supply of the American Sector of Berlin was derived mainly from deep, suitably constructed wells and was subjected to chlorination to provide a free chlorine residual of from 0 05 to 0 10 p p m With the exception of the Tempelhof Air Base which had its own chlorinating system and maintained a chlorine residual of about 0 5 p p m , all American units stationed in the command used this city water without further treatment

For a number of reasons, however, the municipal water supply was viewed with suspicion Both the water and the sewerage systems had suffered extensive damage in the course of the devastating air raids of the war which virtually demolished the city Repairs during and after the war were often inadequate or of a makeshift nature, with the result that the danger of con tamination of the water mains by adjacent damaged sewers was enhanced Furthermore, during the exceptionally severe winter of 1946-1947, frost penetrated unusually far into the ground, causing breakage of many water and sewer mains, and inflicting further damage on the already weakened systems Many sewer lines ruptured completely, flooding streets and basements of ruined buildings with raw sewage, not only endangering the water supply but also creating a serious environmental hazard This widespread fecal contamination remained for many months as a course of potential infection. That the water system was actually invaded by sewage to some degree was demonstrated by frequently positive cultures for coliform organisms observed in routine testing of water specimens collected at various points in the sector Several studies were therefore undertaken to determine what role, if any, the water supply was playing in the dissemination of hepatitis in the command

Owing to the high incidence of hepatitis at Roosevelt Barracks, a careful study of the plumbing and sanitary facilities of this installation was made by a sanitary engineer No cross connections or other deficiencies contributory to the spread of an enteric disease were detected Moreover, during the period of study the degree of fecal contamination of the water samples collected at this compound was no greater than that observed in the rest of the sector

Neefe et al *(65 66)* demonstrated experimentally that hepatitis virus was inactivated in heavily contaminated water subjected to chlorination yielding a free-chlorine residual of 0 4 p p m at the end of 30 minutes contact, provided that the water had

(65) N f J R. Stokes J J Bary J B and R inhold J G D sinfect on of wat o ta aing causat ve gent f inf tious (pidemic) hepatiti J A. M A. 128 1076-1080 Aug 11 1945

(66) Neef J R Bary J B. Reinhold J G. nd Stokes J Jr Inactivation of virus f infect us hepatiti in drinking water Am J Pub Health 37 365-372 Apr 1947

been previously treated with coagulants and filtered Water not pretreated remained infectious in spite of chlorination When chlorination of the pretreated water was omitted there was a 40 percent increase in the incidence of hepatitis among vol unteers who ingested it Thus chlorination of water is apparently effective against the hepatitis virus to a degree depending on the pretreatment, the magnitude of the chlorine residual and doubtless the concentration of the virus The authors assumed that small quantities of the hepatitis virus could theoretically get into a municipal water system and survive under the proper conditions and that this could account for some of the occasional small outbreaks of hepatitis or for apparently sporadic cases at widely separated points served by the same source of water The latter situation seemed to correspond to conditions in Berlin

TABLE 3 *R ults f analy s of o t e w te p c m*

M th	Number of pecim s x min d	Av ge hl me idual		Sp c me w th colo y nt ov 10 per c	
		B rl n	T mp lh f	Numb	P nt
Sept mber	34	0 06	0 44	6	17 7
O tobe	34	0 06	0 39	5	14 7
November	32	0 07	0 50	3	9 4
De embe	29	0 10	0 58	0	0
Janua y	30	0 08	0 69	2	6 7
February	45	0 08	0 64	5	11 1

To further evaluate this possibility, a comparison was made between the average monthly chlorine residuals and the hepatitis rates during the period in question (table 3 and fig 3) At no time did the chlorine residual reach 0 4 p p m nor was the water supply of the American Sector subjected to pretreatment Therefore on the basis of the findings of Neefe et al , it was theoretically possible for the hepatitis virus to survive and be disseminated in the city water supply Assuming that such con tamination had occurred if the concentration of the virus were low it is conceivable that it would have been adversely affected to some extent by even the small chlorine residuals that prevailed in this water system and that this effect would have been reflected in the hepatitis rate Superficially the graph seems to demon strate that some such relationship existed between the hepatitis rates and the fluctuations in the chlorine residual Relatively low residuals in September and October were followed by high hepatitis rates in October and November a rise in the chlorine

residual in November and December was attended by a fall in the hepatitis rate in December and January; and a fall in the residual in January was followed by a sharp rise in the rate in February

Two things, however, cast doubt on the validity of these observations (1) the fluctuations in the chlorine residual were relatively small and perhaps insignificant, and (2) the hepatitis curve closely resembled the usual one observed in the fall and winter months among U S troops in Germany, with a peak in October or November and a secondary peak 3 months later Thus the relationship between this particular curve and the chlorine residual may have been purely fortuitous

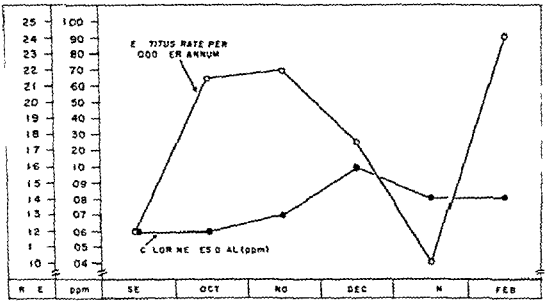


Figure 3 Comparison of hepatitis rates and average chlorine residuals for Berlin Command (exclusive of Tempelhof Air Base) from September 1947 through February 1948

The situation at the Tempelhof Air Base was unique in that this compound had its own chlorinating system which provided residuals from 5 to 10 times higher than those available to other installations of the Sector If the virus were water borne, the incidence of hepatitis might be expected to be lower here than elsewhere but this compound had the second highest rate in the command Moreover, in contrast to the command as a whole, there seemed to be no correlation between its average monthly chlorine residuals and its hepatitis rates during the period of study (fig 4) The significance of these findings is modified, however, by the fact that one facility of the compound (the snack bar) used water direct from the Berlin municipal water system Thus most of the personnel at the Air Base were frequently exposed to drinking water from the city supply and could have *contracted hepatitis from that source*

been previously treated with coagulants and filtered Water not pretreated remained infectious in spite of chlorination When chlorination of the pretreated water was omitted there was a 40 percent increase in the incidence of hepatitis among vol unteers who ingested it Thus chlorination of water is apparently effective against the hepatitis virus to a degree depending on the pretreatment the magnitude of the chlorine residual and doubtless the concentration of the virus The authors assumed that small quantities of the hepatitis virus could theoretically get into a municipal water system and survive under the proper conditions and that "this could account for some of the occasional small outbreaks of hepatitis or for apparently sporadic cases at widely separated points served by the same source of water The latter situation seemed to correspond to conditions in Berlin

TABLE 3 *R sults f analys s o/ out e wat sp c m s*

Mo th	N mbe of spe ime s m d	A er g hlo ine re idual		Sp cim w th lony count ove 10 per c	
		Be l	Temp lhof	N mb	Per t
Sept mbe	34	0 06	0 44	6	17 7
Oct be	34	0 06	0 39	5	14 7
Novembe	32	0 07	0 50	3	9 4
Dec mbe	29	0 10	0 58	0	0
Janua y	30	0 08	0 69	2	6 7
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by high hepatitis rates in October and November, the progressive fall in positive counts in November and December was associated with a drop in the hepatitis rate in December and January, and an increase in the positive counts in January was followed by a sharp rise in the rate in February. Thus there would seem to be a correlation between the degree of fecal contamination of water and the incidence of hepatitis at the expected interval of a month. Here again, however, the relationship might have been only coincidental and the variation in the bacterial colony counts might have been merely a reflection of the fluctuations in the chlorine residual.

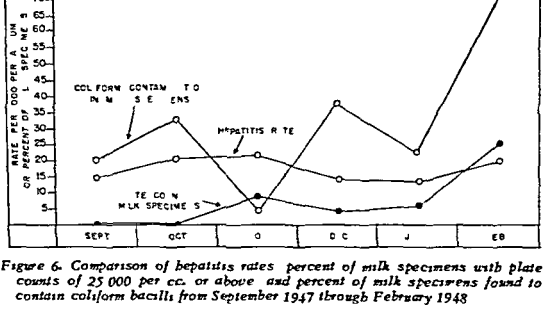


Figure 6. Comparison of hepatitis rates percent of milk specimens with plate counts of 25 000 per cc. or above and percent of milk specimens found to contain coliform bacilli from September 1947 through February 1948

Probably the most that can be said of the above observations is that they are suggestive of, or at any rate consistent with, water borne transmission of the disease via the municipal water system. The next step in the investigation would logically have been to raise the chlorine residual to relatively high levels and observe the effect of this on the hepatitis rate. Unfortunately, however, the water system of the American Sector intercommunicated freely with those of the other sectors so that chlorination would have had to have been increased throughout the city. This project assumed the proportions of a formidable international undertaking and had to be abandoned.

Food borne infection. Of the various food products consumed by Americans in Berlin, milk was the only one considered likely to be instrumental in the transmission of hepatitis. Moreover, the milk supply of the command was obtained from Denmark, a country which during the postwar years had an extraordinarily high incidence of infectious hepatitis. During the period of study

the quality of the milk received varied from good to fair Although most of the samples tested bacteriologically conformed to U S Government standards for grade B pasteurized milk the possibility that hepatitis virus might survive in bacteriologically potable milk had to be considered and it seemed worth while to try to determine whether or not there was any relationship between the hepatitis rate and the degree of contamination of the milk as estimated by colony counts and cultural characteristics observed in routine bacteriologic testing of milk specimens.

The monthly percent of specimens with plate counts of 25 000 per cc or over and the percent of specimens containing coliform organisms are shown in figure 6 No consistent rela tionship seems to exist between these variables and the hepatitis rate Although the variations in the degree of fecal contamination cannot be correlated with fluctuations in the incidence of hepa titis it is of interest to note the prevalence of coliform bacilli in this milk supply These organisms were present in as many as 71 9 percent of samples tested during one period.

DISCUSSION

This study failed to demonstrate either the mode of transmission of hepatitis or the reason for the extremely high incidence in this community although some useful epidemiologic information was obtained Certain relevant factors such as the prevalence of the disease among the German population (for which no reliable statistics were available) and the influence of the widespread fecal contamination of the environment could not be adequately evaluated Contact infection did not appear to play a conspicuous role nor did transmission by blood products contaminated nee dles or syringes seem likely Dissemination by infected food handlers was thought to be ruled out and there was no evidence in favor of spread by respiratory or droplet infection Thus by a process of elimination transmission via the intestinal oral route by some means other than contact seems most likely A detailed investigation of the water supply disclosed conditions compatible with water borne dissemination of the virus although no definite conclusions could be drawn on the basis of the data obtained Further studies along this line appeared promising but unfortunately could not be carried out Food could not be in criminated as a vehicle of transmission of the disease although the milk supply might reasonably be suspected because of the relatively high incidence of coliform contamination found

CONCLUSIONS

In our present state of knowledge of infectious hepatitis in formation regarding the epidemiology of the disease must largely be gleaned from careful study of its behavior in individual out

breaks and epidemics. Such studies have indicated the possibility of (1) respiratory or droplet transmission, (2) unspecified contact transmission, and (3) intestinal oral transmission

The bulk of the evidence presented was in favor of transmission of the disease via the enteric route, through the agency of contact, water, food, flies, or poor environmental sanitation. Convincing support of the theory of transmission via droplets or the respiratory route was conspicuously scarce, and it would seem that for practical purposes this theory may be discarded

In an outbreak of hepatitis in a military community conditions were found to be compatible with water borne transmission of the disease as a result of fecal contamination of the municipal water system Dissemination by personal contact, contaminated needles and syringes, or milk, though considered unlikely, could not be unequivocally excluded

BOOKS RECEIVED

Analgesia and Anesthesia in Obstetrics by *J P Greenhill* M D Professor of Gynecology Cook County Graduate School of Medicine Attending Gynecologist Cook County Hospital Attending Obstetrician and Gynecologist Michael Reese Hospital Associate Staff Chicago Lying-in Hospital Chicago Ill. American Lecture Series Publication Number 159 A Monograph in American Lectures in Gynecology and Obstetrics Edited by *E. C. Hamblen*, M. D F A C. S Professor of Endocrinology Associate Professor of Obstetrics and Gynecology Duke University School of Medicine Chief of the Division of Endocrinology and Endocrinologist Duke Hospital Durham N C. 85 pages illustrated Charles C Thomas Publisher Springfield Ill 1952 Price $2 75

The Medical Annual A Year Book of Treatment and Practitioners Index by 42 contributors Edited by Sir *Henry Tidy* K B E M. A M. D (Oxon), F R C. P and *A. Rendle Short* M. D B S B Sc F R C. S 70th year 444 pages illustrated J B Lippincott Co Philadelphia Pa publishers 1952

Introduction to Physiological Optics by *Armin Von Tschermak Seysenegg* University of Munich Regensburg Extension Formerly of the University of Prague Translation Sponsored by *The American Committee on Optics and Visual Physiology Of the Section on Ophthalmology American Medical Association, American Ophthalmological Society* and *American Academy of Ophthalmology and Otolaryngology* Translated by *Paul Boede* Ph D Director Bureau of Visual Science American Optical Company Instructor in Ophthalmology Harvard Medical School 299 pages illustrated Charles C Thomas Publisher Springfield Ill. 1952 Price $10 50

Body Temp rature It Ch ng s with E tonm t Di se d Th rapy by *W A S ll* Ph D P fe or f B phy s d Phys ol gy U t ty f C lif a Med l Scho l Lo Ang l Calif Am c Le ture S e P bl t on N mbe 147 A M gr ph n Am an L ur in Phy c l Medi s Edit d by *W A S ll* Ph D P f sor of B o phy d Phy l gy U r ty f C l f r M d l S hool L Ang l Cal f Fo m ly Pr f f M d cal Phy s nd Di ctor f P stgr d t C in Phy al Med s Uni e sity f T s M dic l B ch G l t T x 112 p ge ill str t d Charl C Thomas P bl h Spr gf ld Ill 1952

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Th Pharmacol gy f An th ti Drugs A Syll b f Stude t d Cl ni ians by *J h Adri* M D D tor D pa tm t f A th l gy Ch ty Ho p t l N w Orle ns La Pr f or f Surg y T lane U ty School f Med ine A ociat Cli l Prof f Surg y L na St te U ty Sch ol f Med n 3d ed t r d 179 pag illust t d Ch le C Th ma Publ h Spr gf ld Ill 1952 Pr e $9 50

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BRUCELLOSIS

Advances in Therapy

WALTER M. SIMPSON *Captain, MC USNR (Ret.) (1)*

THE advent of the newer antibiotics, notably chloramphenicol, aureomycin, and terramycin, has revolutionized the current therapy of brucellosis. Although the outlook for patients suffering from either the acute or chronic manifestations of the disease has improved enormously since the introduction of these antibiotics, the published reports of the responses to such therapy run the gamut from great enthusiasm to excessive skepticism. Sufficient reliable data are now available, however, to eliminate the long prevalent defeatist attitude on the part of a few writers toward all therapeutic measures against brucellosis.

Before analyzing briefly the relative merits of the agents currently used, it should be emphasized that prophylaxis is still the primary consideration. Cows which harbor brucella and eliminate them in enormous numbers in their milk, feces, and vaginal discharges, often exhibit no superficial manifestations of active brucellosis, such as mastitis, abortion, sterility, and lessened milk yield. Hence there is but one logical method for preventing the transmission of milk borne brucellosis to human beings, and that is by pasteurization. Brucellosis ranks first among the diseases transmitted to man through the use of raw milk and other unpasteurized dairy products. Murray et al. *(2)*, Boak and Carpenter *(3)*, and Zwick and Wedeman *(4)* have demonstrated that complete controlled pasteurization will destroy brucella. The necessity for strict supervision of the pasteurization process is apparent.

For those who live on farms, or in communities in which universal pasteurization of all milk and milk products is not yet mandatory, home pasteurization provides a simple, practical and reliable method for preventing the transmission of milk borne infection to human beings, or to farm animals to which raw milk residues are commonly fed. The large mail-order houses now supply approved home pasteurizers for operation with or without

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(1) Laguna Beach, Calif.

(2) Murray, C., McNutt, S. H., and Purwin, P. Effects of pasteurization upon Brucella melitensis var. suis. J. Am. Vet. M. A. 33: 336, 1932.

(3) Boak, R., and Carpenter, C. M. Thermal death point of Brucella bortus in milk. J. Infect. Dis. 43: 327-329, Oct. 1928.

(4) Zwick and Wedeman. Cited in footnote reference *(3)*.

electricity The vast extension of electrification into rural areas since 1935 has made feasible the use of automatic, thermostatically controlled electric home pasteurizers *(5–7)* The Standard Milk Ordinance of the U S Public Health Service *(8 9)* was operative on a statewide basis in only 11 States and in the territories of Alaska and Hawaii in 1951 All consumers of raw milk are advised to pasteurize it at home as a health precaution

If an approved automatic electric home pasteurizer is not available the following simple methods for pasteurization in the home on ranches or farms, or by isolated military personnel are recommended (1) After the water in the bottom of a double boiler has been brought to a vigorous boil place the inner container with milk in the outer container cover it and continue to apply the same heat for 10 minutes or (2) heat the milk in an open saucepan over a hot flame, to 165 F , stirring constantly then immediately place the vessel in cold water and continue stirring until cool changing the water when it warms up however if a dependable thermometer is not available, bring *the milk to a boil instead * * The simplest method for satisfactorily* heating milk in the home to make it safe for consumption as fluid milk is by the double boiler method described above under (1) *(10)*

For the artificial feeding of infants the traditional practice of boiling cow s milk to fragment and to soften the comparatively tougher bovine milk curd fortunately also provides the additional safety factor of destroying all bacteria contained in the milk Similar dual benefits are derived from the use of canned evaporated or powdered milk The simplest and safest preventive measure against milk borne infections for campers travelers or military personnel operating in primitive areas is to bring cow s or goat s milk obtained locally to the boiling point in a metal vessel followed by quick cooling The use of tinned powdered or evaporated milk or frozen pasteurized milk also provides complete protection

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(5) Th ma R C. Op t t d f h m milk pa t uriz P b H l h R p 64 1411 1422 N 11 1949

(6) Th ma R C. A Study of h Op rat f H m Milk P t ur (mim gr ph d epo). E m tal H lth Ce Publ H l h Ser Cin na Oh Ma h 1947

(7) T out G M nd Bortrea A L. Labor tory pa t urizat tud h m l tr milk pa ur Mi h Agr Exp S t Qua Bull 30 64 Aug 1947

(8) D f Sa tat Milk d F d Bra h P blı H l h Se Commun t wa d d m lk sa on ng f 90 pe or mor d r ng 1949 d 1950 P b H lth R p 66 239-243 F b 23 1951

(9) Mod l m lk g l tio (Go m t S P bl H lth Servic) J A M A 145 338 F b 3 1951

(10) P t ur ng M lk H m U e ty f Minn t Ag ultur Ex ns Serv U S. Departme f Agr lture Ext F ld r 133 Jun 1945

BRUCELLA ANTIGEN THERAPY

Although the use of chloramphenicol, aureomycin, terramycin, and dihydrostreptomycin has greatly enhanced the outlook for most patients suffering from either acute or chronic brucellosis, it is difficult to evaluate the effectiveness of any form of therapy when the natural course of the disease is characterized by natural remissions and by wide swings in its individualized symptomatology

Undulant fever vaccine obtained from *Brucella abortus* and *Brucella suis* has been widely used Vaccines prepared from *Brucella melitensis* should be used only in the relatively rare infections with this variety

Despite the indispensability of the newer antibiotics, they will not control either acute or chronic brucellosis when used alone Harris *(11)*, Koshay *(12)*, Huddleson and Johnson *(13, 14)*, Simpson *(15–20)*, and others are convinced that brucella antigens (undulant fever vaccine, Huddleson's brucellin *(13, 14, 21)*, Harris's *Br abortus* bacterin, Castaneda's M B P vaccine, or Hoffman's B A C vaccine) should be used as an adjuvant in treating chronic brucellosis when the responses to the available antibiotic or chemotherapeutic agencies are disappointing, or relapses follow such therapy administered in presumably adequate doses

No rigidly standardized dosage scheme for undulant fever vaccine therapy is applicable to all patients with this disease

(11) Harris H J Addenda on antibiotic therapy In Brucellosis (Undulant Fever) Clinical and Subclinical 2d edit on Paul B Hoeber Inc N w York N Y 1950 pp 531 544

(12) Foshay L Brucellosis In Barr D P Modern Medical Therapy in General Practice Vol 3 Williams & Wilkins C B Itimore Md. 1940

(13) Huddleson I F and Johnson H W Brucellin potsible specific for undulant fever in man preliminary report Am J Trop Med 13 485 504 Sept 1933

(14) Huddleson I F and Johnson H W Brucellosis Causes Sources of Infection Clinical Diagnosis Laboratory Diagnosis Treatment Bull Central Brucella Station Michigan State College 1938

(15) Simpson W M and Frazer E Undulant fever report of 63 cases occurring in and about Dayton Ohio J A M A 93 1958 1963 Dec 21 1929

(16) Simpson W M Undulant fever report of 33 cases occurring in and about Dayton, Ohio University Alumni Quarterly Ohio State University 17 112 119 1929

(17) Simpson W M Undulant fever (brucellosis) clinicopathological study of 90 cases occurring in and about Dayton Ohio Ann Int Med. 4 238 259 Sept 1930

(18) Simpson W M Clinical picture of undulant fever Ohio State M. J 27 21 27 1931

(19) Simpson W M Undulant fever (brucelliasis) with special reference to 128 cases in and about Dayton Ohio U S N M Bull 29 581 591 Oct 1931

(20) Simpson W M Brucellosis (undulant fever) Ohio State M J 36 1053 1060 Oct 1940

(21) Huddleson I F Johnson H W and Beattie C P Studies in Brucella Infection Report of 100 cases treated with brucellin Bulletin 149 Agriculture Experimental Station Michigan State College May 1936

Experience and good judgment are essential in determining the proper dosage and the optimum treatment intervals for each patient The procedure usually employed with undulant fever vaccines is to test for hypersensitiveness by injecting 0 05 cc of a 1 10 dilution of the vaccine intracutaneously If the patient does *not* show an excessive local or systemic reaction within the next 48 hours an initial therapeutic dose of 0 25 cc is injected deeply into the subcutaneous tissues or intramuscularly Local reactions are minimized by intramuscular injections If no untoward reactions follow the first injection 0 25 cc is usually given 3 days later Ordinarily a third and fourth dose of 0 5 cc a fifth and sixth dose of 0 75 cc. and from 5 to 8 injections of 1 cc are then given at 3 day intervals

If the patient is exquisitely sensitive it is wise to begin with intramuscular doses of 0 1 cc or in rare cases with doses of 0 1 cc of a 1 10 or 1 100 dilution of the vaccine gradually increasing the dose by increments of 0 1 cc until a dose of 1 cc is reached If in the course of the injections an unusually severe local or systemic reaction should occur, the next dose should be reduced to one half the amount which produced the severe reaction and then gradually increased Because a series of about 6 sharp systemic reactions usually accompanied by fever and a transient exacerbation of symptoms is the goal of the treatment only extreme local or general reactions should be avoided Elevations of temperature to from 103 to 105 F are not uncommon within from 4 to 8 hours after the injection of the vaccine Such sharp systemic responses may occur follow in the first injection of small doses of vaccine or may not occur until relatively large doses are given In chronic brucellosis larger doses of the vaccine may be required If no reaction is provoked after 5 or 6 injections of 1 cc the dose may be increased gradually by increments of 0 5 cc to 2 or 3 cc

Although a few patients who have obtained an apparently satisfactory response to vaccine therapy have had little or no febrile systemic reaction the most prompt and lasting results have occurred in those who have had several such reactions Erythema and tenderness at the site of vaccination occur commonly for 1 or 2 days following injection In about 5 percent of patients a local hard tumefaction may persist much longer In a small proportion of such patients sterile abscesses or areas of focal necrosis have developed at the site of injection

Brucellin is a fraction of brucella cells obtained by growing the organism in liver broth The bacteria free active agent is recovered from the liver broth filtrate The dose must be adjusted to the requirements of the patient. After the extent of sensitiveness has been determined by the intradermal injection of 0 1 cc

the usual procedure in nonhypersensitive patients is to give repeated injections of 1 cc at 3 day intervals until the morning and evening temperature between injections tends to become subnormal As with undulant fever vaccine therapy, one objective of this form of therapy is to induce a series of 4 or more febrile, systemic reactions If the duration of illness is less than 10 weeks, the likelihood of a prompt and satisfactory response following 4 injections of 1 cc is greater than in cases of longer duration Patients with long-continued, chronic brucellosis require a larger number of injections and may benefit by gradually increasing amounts up to 5 cc before satisfactory systemic reactions are provoked In highly sensitized persons, it is advisable to start with intramuscular doses of 0 1 cc If there is no severe systemic reaction following this injection, each succeeding dose may ordinarily be doubled, until the larger dosage is attained

In children, the initial dose of undulant fever vaccine or brucellin should not exceed 0 1 cc , and succeeding doses should be increased by increments of not over 0 1 cc High dilution of the vaccine is also mandatory for hypersensitive children

The contraindications to brucella antigen therapy are the co existence of active cardiac or renal disease, advanced arterio sclerosis, meningeal or cerebral localizations of brucella, or the acute fulminating form of the disease

CHEMOTHERAPY

Neoarsphenamine, merbromin acriflavine, nitromersol, thionine, methylene blue, methyl violet, gentian violet, and other chemical substances have been used in the treatment of brucellosis In most instances the reports of the apparently successful use of these substances were based on observations restricted to small numbers of patients observed over short intervals The very length of the list argues against the specificity of any of them

Beginning with sulfanilamide the rapid succession of other sulfonamides has been greeted with nihilism or varying degrees of enthusiasm (*22*) Following the first waves of enthusiastic reception, usually based on brief periods of observation of relatively few patients, subsequent reports of less favorable or entirely negative results appeared. Blumgart and Gilligan (*23*) analyzed the results reported in 31 articles which appeared between 1936 and 1939 24 of the reports were concerned with only 1 or 2 patients Of the 74 patients treated with various sulfonamides, there were 68 apparent recoveries and 6 failures

(*22*) Gaffney M. Report on 5 ca es of Brucella abortus inf ction. Br t. M J 2 885 887 Oct 29 1938

(*23*) Blumgart, H L. d Gilligan D R. Tr atment of undulant fever with sulfa nil mid ad elated compound M Clin North America 23 1193-1203 Sept 1939

Fourteen of the 68 patients (20 percent) relapsed Bynum *(24)* reported 6 patients with brucellosis treated unsuccessfully with large doses of a sulfonamide Long and Bliss *(25)* reported recurrences of infection in 4 of 5 patients whose immediate responses to sulfonamide therapy were apparently satisfactory in 2 brucella were recovered from the blood after sulfonamide therapy was discontinued

Of the various sulfonamides tried in the treatment of brucellosis only sulfadiazine is still used When used alone, it is relatively ineffective but when employed conjointly with streptomycin or preferably with dihydrostreptomycin the effect exceeds that of either alone

The combined streptomycin sulfadiazine treatment was introduced into the therapy of brucellosis concurrently (1947) by Eisele and McCullough *(26)* and by Pulaski and Amspacher *(27)* The wave of reports *(28–33)* between 1947 and 1950 of successful results achieved with this combination left little doubt of its efficacy Dihydrostreptomycin soon replaced streptomycin in this combination because it caused fewer undesirable side effects such as deafness By 1950 however, the combined dihydrostreptomycin sulfadiazine therapy had practically fallen into disuse because of disabling and often permanent neurologic complications and because of the superiority of aureomycin chloramphenicol and terramycin. In certain patients with chronic brucellosis however in whom a full exhibition of antibiotic therapy with or without concomitant antigenic therapy has not yielded satisfactory results a course of combined sulfadiazine-dihydrostreptomycin therapy is justified

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(24) Bynum W T R ur of dul f (b uc ll) f llow ng dmini tr ti f ulfa lamid J A M A 112 835-836 Ma 4 1939

(25) L g P H d Bl E A Cl l nd E p im l U f S lfa lamid Suff py d d All d C mpo nd Ma mill Co N w York N Y 1939 p 209

(26) E I C W d M Cull ugh, N B C mb d tr p my d lf dia tr tm t b uc ll J A M A 135 1053 1055 D 20 1947

(27) Pula ki E J nd Am pa h W H Str p my th py in bruc ll B II U S Army M D p 7 221 225 F b 1947

(28) Harr H J d J t P C. Str pt my nd lf dia (mb d) hr ni b ll is. J A M A. 137 363 364 May 22 1948

(29) Do l ttl S E B ll T me w th pt my in nd sulfadia P oc Staff Me t Clin H lul 15 1 1949

(30) Sp k W W H ll W H Shaff J M d B d A I H ma bruc ll pe f tr m t w th mb nat on of pt my s d lfadia in J A M. A 136 382 387 F b 7 1948

(31) H rr ll W E d N h l D R. C mb ned use f pt my n d ulf d in trea me t f br ll M. Cl N th Am c 33 1079-1088 July 1949

(32) H lma F R Th ff t of comb ned tr atm ur my d dihydro-st pt my B uc lla inf t mi P oc Staff M t. May Cl n. 24 133 1949

(33) Scow E F d Ga od L P Th tr pt my -sulph dia tr tm t f undul f t B M. J 2 1099 1948

ANTIBIOTIC THERAPY

The early reports of results achieved with aureomycin, chloramphenicol, and terramycin were unduly enthusiastic More recent reports reveal that these antibiotics often suppress rather than cure the disease, particularly when inadequate doses are given over too short a period *(34)* Although the breadth of the therapeutic spectrum varies somewhat, as regards the number and kind of micro-organisms favorably influenced by these 3 antibiotics, their therapeutic effectiveness in both the acute and chronic manifestations of brucellosis is essentially similar The relative cost and the absence or frequency of troublesome side effects should determine the choice of antibiotic to be used on any patient.

Fleming *(30)* stated that the indications for using these antibiotics overlap one another, and that each exerts comparable action on pyogenic cocci, gram negative bacilli of the coli typhoid group, brucella, the rickettsias, and some viruses, and that all 3 exert a rapidly specific destructive effect on intestinal micro-organisms within 24 hours following the oral administration of any one of them, cultures made from feces usually contain only some mycetes. This sudden shift in the intestinal flora accounts for the ascendancy of mycetes over bacteria and for the frequent development of mycotic invasions of the mucosa of the vagina, vulva rectum, anus, mouth, tongue, pharynx, and contiguous moist skin surfaces Harris *(36)* and Behrman *(37)* recovered pure cultures of *Candida albicans* from vaginal and perianal exudates in patients who had pruritus vulvae and/or pruritus ani after receiving either aureomycin or chloramphenicol The use of fungicides produced prompt resolution of the mycotic lesions Such distressing side effects apparently occurred less frequently in patients treated with chloramphenicol or terramycin than in those for whom aureomycin was prescribed Similarly, the oral administration of chloramphenicol or terramycin is attended by fewer and less severe gastrointestinal disturbances, such as anorexia, epigastric pain, nausea, vomiting, and diarrhea Deficiencies in the absorption of components of the vitamin B complex induced by these 3 antibiotics also contribute to the complication of monliasis

(34) Kullough J H Magill G B and Smith R. C. Terramycin chloramphenicol and aureomycin in acute brucellosis preliminary report J A. M A. 145 553 555 Feb 24 1951

(35) Fleming A. Cited in Report by Drs D Gottlieb and Perrin H Long (U S. A.) to the Second International Congress on Antibiotics (Foreign Letter) J A. M A 143 1443 Aug 19 1950

(36) Harris H. J Aureomycin and chloramphenicol in brucellosis with special reference to side effects J A. M. A 142 161 165 Jan 21 1950

(37) Behrman H. T Pruritus vulvae due to aureomycin. J A M. A. 144 995 Nov 18 1950

Fourteen of the 68 patients (20 percent) relapsed Bynum *(24)* reported 6 patients with brucellosis treated unsuccessfully with large doses of a sulfonamide Long and Bliss *(25)* reported recurrences of infection in 4 of 5 patients whose immediate responses to sulfonamide therapy were apparently satisfactory in 2, brucella were recovered from the blood after sulfonamide therapy was discontinued

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(24) By m W T R ur of dul f (b uc ll) f ll w ng dmini tra ti of lfanilamid J A M A 112 835-836 Ma 4 1939

(25) L g P H d Bl E A Cl l d E p im l U f S lfa lamid Sulf pyrid d All d C mpo nd Ma mill Co N w York N Y 1939 p 209

(26) E l C. W d M C ll ugh, N B Comb d tr pt my nd lf dia tr tm t b uc ll i J A M A 135 1053 1055 D 20 1947

(27) Pula ki E J nd Am pa b W H Strep my th py in bruc ll B ll U S Army M Dept 7 221 225 F b 1947

(28) Hart H J a d J P C Str pt my nd lf dia (mb a d) hr ni b ll J A M A 137 363 364 May 22 1948

(29) D l rtl S E B ll T tme w h a pt my nd lfadia P oc Staff Me Cl H lul 15 1 1949

(30) Sp k W W H ll W H Shaff J M d B a d A I H ma bruc ll pe f tr m w th mb nat on of ptomyc d lfadia ne J A M. A 136 382 387 F b 7 1948

(31) H r ll W E d N b l D R. C mb ned us f pt my n d ulf di in trea me f bruc ll M. Cl n. North Am 33 1079-1088 July 1949

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(33) Scow E F nd Ga od L P Th tr pt my -sulphadia tr tm f undul f B t M. J 2 1099 1948

25 mg per kg of body weight every 24 hours, divided into 4 equal doses, for adults of average weight, the usual dose is 500 mg every 6 hours This should be continued for 1 or 2 days beyond the time when the fever and other signs and symptoms have receded Patients with severe acute infections who do not respond satisfactorily within 48 hours should be given 500 mg or more every 3 hours The optimum treatment schedule with orally administered aureomycin has not been definitely established for patients suffering from low grade chronic brucellosis In such patients, the preliminary oral administration of from 250 to 500 mg daily for 2 or 3 days may be desirable, followed by progressively increased amounts of aureomycin up to the more standardized doses employed in patients with acute brucellosis

The prompt and dramatic therapeutic effects following the oral use of aureomycin noted by Spink et al *(40)* in 24 patients acutely ill with brucellosis caused by *Br melitensis* are in contrast to the failures encountered by Green and Stein *(41)* following a similar therapeutic program in 3 patients, all of whom were laboratory workers accidentally infected with *Br suis* In these 3 patients with acute brucellosis, aureomycin exerted only a temporary suppressive effect and was of little or no value in preventing clinical and bacteremic relapses This striking difference in the response of brucellosis due to *Br melitensis* and that caused by *Br suis* following apparently adequate doses of aureomycin would appear to indicate that the relative degree of pathogenicity of the 3 varieties of brucella may have a significant bearing on the therapeutic effectiveness of the currently available antibiotics All 3 of the newer antibiotics apparently exert a more uniformly favorable effect on acute brucellosis caused by *Br abortus* Despite the rapidly favorable immediate clinical responses to the 3 newer antibiotics, an analysis of successive reports *(36 40 42–51)* reveals clinical relapse rates ranging up to 22 percent

(40) Spink W W Bud A I Cantanda M R and Sylvatore R Aureomycin therapy in human brucellosis J A M A 138 1145 1148 Dec 18 1948

(41) Green T W and Stein L F Failures with aureomycin in treatment of infection with Brucella suis report of 3 cases J A M A 144 380 382 Sept 30 1950

(42) Hall H J Bacillosis (Undulant Fever) Clinical and Subclinical Publ Health Bull No 296 pp 1 204 1944

(43) Brand A I Hall W H. and Spink W W Aureomycin therapy in human brucellosis Brucellosis abortus J A M A. 141 831 835 Nov 19 1949

(44) Bryan M S Schoenbach E B Wood R H and Long P H Treatment of chronic brucellosis with aureomycin Bull Johns Hopkins Hosp 84 444 460 May 1949

(45) Harris H J Aureomycin and chloromycetin in brucellosis with special reference to chronic brucellosis Bull New York Acad Med 25 458 July 1949

(46) Rinaldo R J and Payne E H Treatment of chronic brucellosis with chloramphenicol and aureomycin J A M A 142 159-161 Jan 21 1950

Perhaps the most significant controlled comparison of the therapeutic effects achieved with the dosages then recommended for terramycin chloramphenicol, and aureomycin was reported by Killough et al *(34)* Of 39 patients acutely ill with brucellosis 16 were treated with terramycin hydrochloride 12 with chloramphenicol and 11 with aureomycin hydrochloride The immediate clinical responses were uniformly excellent with each of these antibiotics, and from this viewpoint no advantages of any one antibiotic over another were observed. As regards patient acceptability terramycin and chloramphenicol were preferred No significant differences were observed in either the clinical or the bacterial relapse rates with the 3 drugs but the significantly high combined clinical bacterial relapse rate of 69 percent led these investigators to conclude that these 3 agents suppress rather than cure brucellosis when given in the currently recommended doses

As with aureomycin therapy the dosage schedules for chloramphenicol and terramycin remain in an unsettled state Furthermore the doses required by a given patient with either acute or chronic brucellosis will vary widely depending on the severity of the infection and the relative tolerance of the patient for the selected antibiotic or combination of antibiotics The printed dosage schedules accompanying the original packages should be consulted by the physician in determining a point of departure for the initial dose Additions to or subtractions from such doses may then be made to meet the requirements of individual patients By the same token recognition should be given to the fact that a temporary remission is not a cure and that relapses will demand further adjustments of dosage schedules both as regards the amount and the duration of therapy to prevent recurrence

In 1952 a succession of reports *(5°–57)* revealed that the prolonged administration of chloramphenicol may have been a

(47) Woodw d T E Chlor my tin nd my th rap l A I Med 31 53 82 July 1949
(48) Galp 3 F Ca { bot s af n d w th ur my B M J 1 1037 1038 Jun 11 1949
(49) Ros H M. d Kn l d Y J Aur my t m t f inf ou di Am J M d 7 532 541 O t. 1949
(50) W ll y J F L d Coope T V Ca f nodula f trea d by hl m ph l B M. J 2 265 266 July 30 1949
(51) W odwa d T E Smad l J E H lbr k W A J nd R by W T Sympo b tic be f tal ff t f hloromy t bruc ll J Cl In g t 28 968-976 Sep 194
(52) Cl d D B d H lbr k A A F tal pla ti mia occa d w hl ramphc l (hloromy) th rapy port f 2 ca J A M A 149 912-91 J ly 5 1952
(53) Smil y R K. Ca rwr ght G E d Wi be M M F l pl t t f llow ng hl ramph l (hl my) dm nat on J A M A 149 914-91 July 5 1952

contributing factor in several deaths from aplastic anemia. The possibility that other broad spectrum antibiotics may also act occasionally as bone marrow depressants is being studied In most instances in which fatal aplastic anemia occurred, chloramphenicol was given over long periods In other nonfatal cases, granulocytopenia, neutropenia, and epistaxis occurred Prompt recovery was the rule when the antibiotic was discontinued and appropriate supportive therapy was instituted The fact that chloramphenicol has been given to thousands of patients throughout the world with unquestionably favorable effects for several years without such hematopoietic depression would indicate individual sensitization, undue prolongation of therapy, and a cumulative effect of the drug All investigators agree that these discoveries make it mandatory that careful evaluation be made of the blood status of all patients to whom chloramphenicol and similar antibiotics are given, and "that biweekly blood counts be done and the drug promptly discontinued where early signs of bone marrow injury are discovered, that the use of the drug should be limited to infections that in themselves or by their complications endanger the life of the patient and in which such antibiotic therapy has proved effective " *(55)*

The treatment of patients with chronic brucellosis differs from the treatment of those with acute brucellosis The extraordinary latency of chronic brucellosis and the greater likelihood of relapses following apparent recovery place such patients in much the same category as those suffering from chronic tuberculosis The comparable quasi symbiotic parasitism of brucella and of *Mycobacterium tuberculosis* in living body cells explains the difficulties encountered in dislodging and destroying such micro-organisms with any available drug Hence, the expectations from any form of therapy for chronic brucellosis will be uncertain until new and more highly specific agents, or combinations of agents, are introduced into chronic brucellosis therapy

Harris *(36, 45)* has had more encouraging results in the treatment of chronic brucellosis with chloramphenicol or aureomycin than with any pre-existing agents Fifty five patients with long continued chronic brucellosis received aureomycin by mouth, more than one course of aureomycin therapy was required by

(54) Sturgeon P F tal pla tic anemia in childre following chloramph nicol (chlor my tin) th rapy report of 4 cases J A. M A 149 918-922 July 5 1952

(55) Mar h ll L B (editor) Administration of chloramph nicol M d News L tter 20 2 Aug 8 1952

(56) Hargra M. M. Mills S D nd Heck F J Aplastic anemia associat d with dministr tio f chlor mph n col Proc Staff Me t Mayo Clin 27 280 281 July 16 1952

(57) L w nce J S Adams W S nd Valentine W N Whit bl od cell ch ng s in cl ic l disorders J A M. A. 150 454 460 Oct 4 1952

23 patients 49 (89 percent) recovered partially or completely during periods of observation extending from 1 to 6 months A total of 25 grams of chloramphenicol was given by Harris to 14 patients similarly affected with chronic brucellosis They were observed closely for from 1 to 4 months 3 required one or more additional courses of the drug partial to complete recovery occurred in 11 (78 5 percent) Ralston and Payne *(46)* achieved practically identical results following either chloramphenicol or aureomycin therapy in 66 patients with chronic brucellosis

SYNERGISTIC ACTION OF COMBINED CHEMO ANTIBIOTIC THERAPY

The most recently published reports *(58–60)* on the therapy of either acute or chronic brucellosis indicate that the synergistic effects produced by various combinations of antibiotic chemo therapeutic and/or antigenic agents provide much greater promise of curing the disease than have been achieved with any such substances used alone The earlier demonstrations of the more effective synergistic effects produced when streptomycin or dihydrostreptomycin was combined with sulfadiazine led Herrell and Barber *(61 62)* and Heilman *(32)* to experiment with the combined use of aureomycin and dihydrostreptomycin first in laboratory animals and then in patients with brucella infections For patients Herrell and Barber used 3 grams of aureomycin and 2 grams of dihydrostreptomycin daily for 14 days The promptly favorable therapeutic effects exceeded those previously obtained with any other available compounds Equally favorable results following combined terramycin dihydrostreptomycin therapy were reported by Herrell and Barber in 1952 Rosenbaum and Reveno *(63)* also found the combination of aureomycin and dihydro streptomycin administered simultaneously to be superior to any form of therapy previously tried. After obtaining promising results from in vitro laboratory studies with the combination of sulfadia zine dihydrostreptomycin and aureomycin Eisele and McCullough *(64)* used these 3 drugs concurrently in 12 patients with cul

(58) W C A d K gh V S ppr tt c f t mi b l dr g B uc ll m l t ns inf t m J Imm nol 65 509-514 N 1950

(59) E gli h A. R T t K B d Goul t P L Sy g c b mb na u t g t rr my d o th f b P oc d g F fty Fir t G ral Me ng Soc ty f Am ca Ba er l g 1951

(60) Arms g C. W J d La A. E Eff ct f mb na f b P d m na rug sa d P vulga nd J L b Cl M d 37 584 592 Apr 1951

(61) H rrell W E d Ba be T E C mbi d f ur mycin d dihyd p my tr m t f b uc ll P oc Staff M t. May Cl 24 138 19

(62) H ll W E d Ba b T E N w m thod f trea m t f bru ll J A M A 144 519-524 Oc 14 1950

(63) R baum H d Rev W S T a m t f bruc ll w th omb ur omy d d hydrostr p my H pe Ho p B ll 8 1 4 J n. F b 19

(64) E l C. W nd McCull gh N B T m f bruc ll s Illin M 96 241 244 Oct. 1949

turally proved brucellosis with highly encouraging results All of these patients had failed to respond previously to courses of chloramphenicol, aureomycin, and combined streptomycin sulfadiazine None of them had either a clinical or bacteriologic relapse during 3 years of continuous post-treatment observation Carle developed a well standardized experimental technic for evaluating therapeutic procedures against brucellosis in experimentally infected laboratory animals He found the Eisele McCullough triple antibiotic combination to be far superior to any other combined treatment used

Encouraging experimental studies of brucella infected laboratory animals and also of patients with brucellosis treated by combining streptomycin (or dihydrostreptomycin) with terramycin or chloramphenicol are in progress Many investigators are engaged in testing the curative effects of newly discovered antibiotics combined with chemotherapeutic agents with or without brucella antigens Happily, the synergistic actions of various combinations of drugs against the 3 varieties of brucella are being investigated in many parts of the world As a result, there is a definite trend toward the use of combinations of compounds which will produce cure, without undesirable side effects rather than remission

Janbon and Bertrand *(65)* noted immediate and favorable responses to aureomycin in 50 patients with either acute or chronic brucellosis All were observed at frequent intervals for at least 6 months following aureomycin therapy An apparently lasting clinical recovery occurred in 85 percent, in the rest, a clinical relapse occurred in from 15 days to 3 months after the discontinuance of aureomycin These authors stressed their more uniformly successful results when undulant fever vaccine was used in conjunction with aureomycin Bassi and Menci *(66)* found that the concomitant use of anti brucella vaccine therapy with either aureomycin or chloramphenicol diminished the quantities of antibiotic required for curative effects and produced more lasting immunity

(65) J nbon M and Bertrand L Cit d in treatment of brucellos with a reomyci (F ign Letters) J A M A 145 1287 Apr 21 1951

(66) B i M a d M oc S Th rapy of bruc ll is. Settimana Medica Florence 38 366, N v 30 1950 (Med cal Liter tur Ab t cts) J A M A. 146 1171, July 21 1951

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THE ROLE OF THIAMINE HYDROCHLORIDE IN DENTISTRY

Part III (1)

JAMES L. E. BOCK, *Lieutenant Colonel, USAF (DC)* (2)

PROPHYLACTIC USE OF THIAMINE

THE prophylactic use of thiamine has long been advocated for conditions, such as feenle diseases, hyperthyroidism, pregnancy, and lactation, in which the metabolism is greatly augmented. It is also recommended when it is present in inadequate amounts in the diet or when gastrointestinal disturbances are present that prevent its proper absorption. The general purpose of prophylactic doses is to prevent the occurrence of neurologic and cardiovascular disturbances that are associated with thiamine deficiency. The prophylactic doses range from 1 to 3 mg. by mouth daily. When gastrointestinal disturbances are present and assimilation is impaired, parenteral administration is indicated.

Prevention of pain. Whitfield *(139)* reported the use of thiamine in the prevention of pain in dry sockets. He selected 63 patients who had teeth to be extracted whom he regarded as being likely to develop dry sockets. As a prophylactic measure, he administered 100 mg. of thiamine intramuscularly to each of these patients prior to extraction. Five patients developed dry sockets which necessitated an additional injection of 50 mg. of thiamine for relief of pain. The remaining patients did not develop dry sockets. In 100 control patients who received no prophylactic injection of thiamine, 61 developed dry sockets in from 3 to 5 days after extraction. Although these observations suggest that thiamine may be useful in the prevention of dry sockets, this type of evidence is difficult to evaluate. It cannot be determined whether any of the thiamine-treated patients would have necessarily developed dry sockets had they not been treated with thiamine prior to extraction. In spite of the prophylactic use of the vitamin, 5 of 63 patients developed dry sockets.

(1) Part I appeared in the U. S. Army and Navy Forces Medical Journal, vol. 4, pp. 81-97, Jan. 1953; and Part II, on pp. 181-196, Feb. 1953.

(2) Building Air Force Base, Washington, D. C.

(139) Whitfield, A. J.: Use of thiamin chloride in prevention of pain from dry sockets, J. Am. Dent. A., 28: 450-452, Mar. 1941.

Massive doses of thiamine parenterally administered are largely excreted within the first hour practically all of the remainder being excreted within 24 hours Because dry sockets do not usually develop until about the fourth day after extraction, it does not appear feasible that a sufficient amount of the thiamine given earlier would still be present to exert a preventive effect. If the purpose of the prophylactic administration of thiamine is to raise and sustain the blood level for a definite period then repeated oral or parenteral doses for several days would be more efficacious than a single dose

Case 7 A full mouth extraction was performed in several sessions on a 24 year-old man because of a severe periodontal disease On his first visit, the maxillary left bicuspids and molars were extracted. One week later he returned to the clinic complaining of pain which had been present since the extractions The sockets did not resemble true dry sockets but rather a delayed healing process in which there was a lack of granulation tissue and exposure of part of the bony alveolus One hundred milligrams of thiamine were given intramuscularly with complete relief of pain in 20 minutes The pain did not return and tissue granulated over the exposed alveolus within a few days The patient was given 5 mg of thiamine orally 3 times daily for 4 days prior to his next visit at which time the posterior teeth in the left mandible were extracted. Healing was slow but no pain was experienced The posterior teeth in the right mandible were extracted 10 days later without the prophylactic use of thiamine Postoperative pain and delayed healing resulted This was promptly relieved by an intramuscular injection of 100 mg of thiamine Prior to extracting the posterior teeth in the right maxilla the drug was again given by mouth for 4 days Postoperative pain did not occur nor was healing unduly delayed No thiamine was administered prior to extracting the lower anterior teeth Some postoperative pain was experienced but was not as severe as previously The prophylactic use of thiamine prevented postoperative pain from occurring following extraction of the anterior maxillary teeth Whenever thiamine was not used as a prophylactic measure in this patient postoperative pain and delayed healing resulted

Thiamine was given parenterally to 20 patients requiring gingivectomy in order further to study and evaluate its use in the prevention of pain The mouth of each patient was divided into quadrants and gingivectomy was performed on 1 quadrant at a time with about 1 week elapsing between operations Ten milligrams of thiamine was infiltrated intraorally in 1 quadrant on each patient. As a control the remaining quadrants were not so infiltrated Different quadrants were used for the prophylactic injections of thiamine among the 20 patients so that

an equal number of maxillary and mandibular quadrants were represented At the completion of the treatment of each patient he was asked to compare the postoperative reaction in the 4 quadrants Five patients reported no pain or sensitivity of teeth in the thiamine treated quadrant and pain and sensitivity in the untreated quadrants, 3 reported markedly less in the treated quadrant, 5 reported slightly less in the treated quadrant, 2 reported no discomfort either in the treated or untreated quadrants, 4 reported equal pain and sensitivity (slight) in both treated and untreated quadrants, and 1 reported pain and acute sensitivity in all teeth with possibly more pain in the treated quadrant Of the 20 patients, 13 obtained beneficial results

Pain following gingivectomy is not frequently severe, but in most patients there is some pain and increased sensitivity of the teeth It is the dentist's responsibility to eliminate pain insofar as possible in all operative procedures To this end, thiamine seems to be of some value in reducing pain and hypersensitivity of teeth following gingivectomies

EFFECT OF THIAMINE ON PAIN THRESHOLD

In order to determine to what extent thiamine affects the pain threshold, measurements of this threshold were accomplished by a method similar to that of Shriner which consisted of estimating muscular sensitivity A mercury manometer, constructed from a U-shaped, glass tube marked off in millimeters up to 600, was attached to an ordinary sphygmomanometer cuff The test was accomplished by placing the cuff about the patient's calf muscles and pumping quickly to prevent ischemia until the patient felt a definite cramping pain in the muscle The pressure reading in millimeters of mercury was recorded It was found that the calf muscle was more sensitive to pain and a more accurate reading could be obtained than when the arm muscles were used

Shriner observed that the pain threshold for the average man was much higher than that for the average woman, but I found that women showed a slightly higher threshold than men Tests on 50 clinically normal men showed an average of 290 mm Hg pressure while tests on 50 clinically normal women showed an average of 310 mm Hg Tests were recorded on 16 patients with postoperative pain They were repeated immediately after the pain was relieved by the use of thiamine Whenever possible, tests were repeated a week or 2 after recovery All patients in this series were relieved of pain with a single injection of thiamine Table 1 shows the results of the tests and the dose of drug given to each patient.

Ten milligrams of thiamine were infiltrated intraorally in 13 of the patients The pain threshold was not affected in 11 of these Only 2 (patients 4 and 15) showed an increased pain threshold after thiamine had been injected One hundred milligrams of the drug were injected intramuscularly in 3 patients, all of whom showed a definite raising of the pain threshold after the injection The increase in pain threshold occurred simultaneously with relief of pain Suspecting a possible subclinical thiamine deficiency in patients 1 2 and 15, an effort was made to raise the pain threshold by the daily oral administration of multivitamins but no increase was observed in these patients after 30 days of this therapy

TABLE I *Pai th h lds o 16 pat ts w th p toperat v pa*

P t nt	P thr h ld on adm s n (mm Hg)	P nt l d f th am n (mg)	P i thr h ld ft r p i eli f (mm Hg)	P i thresh ld ft 1 or 2 wk (mm. Hg)
1	200	100	260	200
2	220	100	280	220
3	280	100	320	320
4	220	10	300	300
5	200	10	200	200
6	460	10	460	460
7	180	10	180	180
8	320	10	320	320
9	280	10	280	
10	200	10	200	200
11	260	10	260	260
12	240	10	240	240
13	200	10	200	200
14	280	10	280	280
15	200	10	260	200
16	240	10	240	

P tu t t labl f h k

A study of the effect of thiamine on the pain threshold of 10 clinically normal volunteers was made One hundred milligrams of thiamine were injected intramuscularly in all and pain thresholds were recorded prior to injection 20 minutes after injection and then once each hour The threshold was definitely raised in all but 2 subjects A rise of from 18 to 55 percent (average 37) was noted within 20 minutes after injection This level was usually maintained for about 2 hours beginning to

decline in the third hour, and gradually returning to the original level in from 4 to 6 hours Two subjects used in this study exhibited no change in their pain threshold One had recently been treated with massive doses of thiamine given parenterally over a 30 day period It would appear that when the thiamine content of the body is already high, additional thiamine does not raise the pain threshold

Pain thresholds recorded on 84 women, who were in their seventh to ninth month of pregnancy, revealed an average of 233 mm Hg. All but 5 had been taking multivitamins daily by mouth The approximate daily amount of thiamine hydrochloride taken was 6 mg In comparison to the average pain threshold of 310 mm Hg for the normal woman, these thresholds appear to be unusually low The low pain thresholds observed may be interpreted to indicate that the ingested thiamine was not being properly assimilated or was insufficient to meet the increased requirements of pregnancy It is also possible that the measurement of pain threshold by a pressure method may be unduly influenced by various circulatory disturbances of the legs such as varicosities and edema which are commonly associated with pregnancy This latter explanation is supported by the fact that the average pain threshold of 21 women in their second puerperal month was 306 mm Hg None of these women suffered any circulatory disturbance of the extremities

TOXICITY OF THIAMINE

Jolliffe *(89)*, in treating over 3,000 patients with massive doses of thiamine, did not observe any toxic reactions due to the vitamin and cites other observers as having had similar experience Thiamine is not to be considered as a drug with definite limits as to dose but rather as a substance which is necessary to the body for proper functioning *(140)* Unlike the fat soluble vitamins, it is water soluble and is not stored to any appreciable extent in the body Any excess of thiamine that is not stored or utilized by the body is rapidly excreted by the kidneys

Side reactions have been reported when thiamine is injected intraspinally The sympathetic nervous system is stimulated *(90)* and a feeling of warmth in the extremities, slight elevation of temperature, weakness, buzzing in the ears, and a period of exacerbation of pain may follow its use *(141)* These symptoms

(140) Cowgill G R Physiology of vitamin B_1 In The Vitamins A Symposium Arranged Under the Auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association American Medical Association Chicago Ill 1939 pp 159 178

(141) Resert B H and Grossman, M. O Intraspinal thiamin chloride in treatment of gastric crises or lightning pains in tabes dorsalis report of 8 cases J Nerv & Ment Dis 101 372-377 Apr 1945

may occur when doses of over 20 mg are administered and may last for from several hours to several days *(90)* Doses of from 5 to 10 mg apparently can be injected into the spinal canal without producing any untoward reactions *(135)* Given intraspinally, thiamine remains in the cerebrospinal fluid for several days *(90)* For this reason uncontrolled intraspinal administration may cause an overstimulation of the central nervous system which in animals has resulted in paralysis of the respiratory center and death *(142)* Exacerbation of pain in painful dental disorders is observed when thiamine is infiltrated intraorally No other untoward reactions have been noted

A number of cases have been reported in which mild to severe reactions have occurred following parenteral administration of thiamine *(143–145)* The symptoms have been of an anaphylactic nature and not those of toxicity Two anaphylactic deaths have been reported following parenteral administration *(146 147)*

Weigand *(148)* reviewed all case reports of reactions to thiamine in the past decade and concluded that intolerance to thiamine develops with relative infrequency Most of the reactions followed intravenous injection given either daily or weekly for several doses When patients have had a series of thiamine injections followed by a rest period of a week or more it is suggested that small initial doses should be administered intramuscularly rather than intravenously if parenteral therapy is to be resumed The dose may be increased when it is evident that the patient has not been sensitized

If minor allergic symptoms such as sneezing flushing of the face itching at the site of injection asthma nausea and vomiting develop after parenteral administration, subsequent doses should not be given until desensitization can be accomplished. Patients in whom a sensitivity is suspected may be tested by intradermal injection of a diluted thiamine solution Treatment for anaphylactic shock is artificial respiration and the intra

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(142) Haley T J d Fle h A M T ty udy f th mi hyd ochlor d S nc 104 567 568 D 13 1946

(143) Sch ff L C llap f ll w g pa l dmin tr f l t f th ami hydrochl r d J A M A 117 609 A g 23 1941

(144) E g lh d H. T d B d V C S y to thiam hydrochlo de po ial h za d omm ff proc dur A All gy 4 291 292 July A g 1946

(145) Law C. L. S t zat hiamin hyd ochl d J A M A 117 176 July 19 1941

(146) Mill C A. Ab tract f di us o paper f Dr Ruff d J ll ff J A M. A 117 1500 1501 N 1 1941

(147) R g ld I M. d W bb F R S dd d h f ll w g ntra n j f h m hyd hl d J A M. A 130 491 492 F b 23 1946

(148) W ga d C G Rea t tr b d to dminstr ti f h m hl d Ge tr 5 274 279 Sept Oct. 1950

venous injection of 1 cc of a 1:1,000 solution of epinephrine *(143, 149)*

MODES OF ADMINISTRATION

The route of administration of thiamine depends on the site of the desired action, existing local and systemic conditions, the rapidity with which a response is to be elicited, and whether it is to be used as a dietary supplement, prophylactic measure, or therapeutic agent. Oral administration may be used whenever body requirements are increased or if an insufficient amount of thiamine is present in the diet, provided no gastrointestinal disturbance is present to interfere with absorption. In the past, baker's yeast has been prescribed as a convenient means of administering thiamine and other members of the vitamin B complex, but Parsons et al *(150)* showed that thiamine is not readily absorbed when baker's yeast is ingested. Ness et al *(151)* found that viable, fresh baker's yeast was not only not absorbed but it interfered with the absorption of thiamine from other sources

Prevention or reduction of postoperative complications such as dry socket pain, trismus, and hypersensitive teeth may be obtained by giving thiamine for 4 or 5 days prior to operation Small oral doses of the drug have been found to be more completely absorbed than large doses *(33)* When over 5 mg is ingested, from 50 to 75 percent of the total amount is excreted in the stools *(42)* Therefore, the recommended oral prophylactic dose is from 1 to 5 mg t. i d

Free thiamine, but not cocarboxylase, is active in prohibiting the effects of acetylcholine and is essential in maintaining the chemical equilibrium of the nerve cell *(23)* During degeneration or when the nerve is injured, thiamine is rapidly lost and must be replaced in the free form to re-establish proper nerve function When orally ingested thiamine is absorbed from the small and large intestine, it is carried to the liver *(102)* where a major portion is transformed into cocarboxylase and some is retained for storage *(37)* before entering the general circulation Ninety percent of the total blood thiamine is in the form of cocarboxylase

(149) J Iliff N Abstract of D scuss o on papers of Drs Ruffin and Joffiffe J A M A. 117 1501 Nov 1 1941

(150) P ns H T Williams n A. and Johnson M. L. Ava lability of vitamins fr m ye st bs ption f th amine by human subjects from var ous types of baker s yeast. J Nutrit on 29 373 381 Jun 1945

(151) Ness H. T Pric E L. d Parsons H T Thiamin depleti of human subj cts o d t ch n thiami Science 103 198 199 Feb 15 1946

(152) Grollma A Pharmacology nd Therapeut cs L a & Feb ger Philadelphia P 1951 p 31

(36) Very little free thiamine is able to reach the affected nerves when it is given by mouth When it is parenterally administered absorption of the free form takes place almost immediately and it is conveyed rapidly by the circulation to the affected part before phosphorylation to any degree can take place Beneficial results are thereby obtained in nerve diseases promptly and effectively Hence in the therapeutic use of large doses of thiamine when the action of free thiamine is desired administration should be parenteral rather than oral

Parenteral administration can be accomplished in various ways Intraoral infiltration or submucous injection produces the quickest response in the treatment of certain oral conditions Smaller concentrations are more effective when injected intra orally than when injected intramuscularly In painful conditions of the oral cavity intraoral injection produces a period of exacerbation of pain which in some patients is severe It is contraindicated (1) when the existing pain is so severe that increasing the pain even for a short time is undesirable (2) in the presence of acute inflammation and (3) when a systemic effect as well as a local effect is desired High concentrations of thiamine injected intraorally are also contraindicated not only because of the more severe exacerbation of pain but because rapid absorption into the circulation may further the development of sensitization especially when repeated doses are given The therapeutic dose is 10 mg

Intramuscular injection produces a mild burning sensation at the site of injection but the local irritation is less than that following intraoral injection Furthermore there is no exacerbation of pain if pain is present. The injection may be either in the deltoid muscle or in the upper, outer quadrant of the buttock. Larger intramuscular doses are required for effective therapy in dental disorders than are required when intraoral injections are given Response to treatment is not as rapid as it is following intraoral injections but the difference in time is negligible because using either route beneficial results are usually obtained in a matter of minutes Intramuscular injection is the method of choice when large doses are to be given over a long period and when a systemic as well as a local effect is desired The usual therapeutic dose is 1 cc (100 mg) of concentrated thiamine hydrochloride solution

Intravenous injection has been used extensively because of its immediate effect and the smaller dose required, but almost all of the cases in which sensitivity has developed or untoward effects have been observed have occurred following the intravenous injection of large doses of thiamine For this reason intravenous injection is not recommended Furthermore as a

precautionary measure in giving intramuscular injections, aspiration should be attempted to make sure that the vitamin is not directly introduced into a blood vessel The therapeutic dose is from 10 to 50 mg

Intraspinal injection has been used in the relief of intractable pain in inoperable cancer and chronic inflammatory and degenerative diseases of the central nervous system *(90, 135 141)* It has proved beneficial when other routes have failed, but, in dentistry, there will be little occasion to use intraspinal injections because most dental conditions involve the peripheral nervous system When dental conditions are associated with central nervous system diseases, a neurologist or neurosurgeon should be consulted The dentist should, nevertheless, be aware of the use and indication for intraspinal administration The therapeutic dose is from 5 to 100 mg

DISCUSSION

Thiamine is an important therapeutic agent in dentistry, especially in the control and prevention of pain From a physiologic standpoint, the use of thiamine is most desirable because it is a normal metabolic substance, the use of which is associated with a minimum of side reactions With the exception of intraspinal injections, there is no danger of overdosing because any excess that is not stored or utilized by the body is rapidly excreted by the kidneys

A new method of parenteral administration of thiamine, which may be termed intraoral infiltration or submucous injection, was shown in this study to be of value in the treatment of certain dental conditions The beneficial effects obtained by this method were more prompt and more effective than those produced by other parenteral routes and the dose required was much smaller That parenteral administration inhibits muscular contractions was shown in a series of patients with trismus This suggests other uses in dentistry such as the induction of muscular relaxation in patients with fractured jaws and reducing the muscular fatigue experienced in patients with new dentures

The raising of the pain threshold produced by the parenteral administration of thiamine revealed in this study opens up many new possibilities for the application of thiamine in dentistry Its analgesic effect suggests its use in preoperative medication Relieving the apprehension, nervousness, and tenseness of the dental patient would be of value, especially in patients who are subclinically deficient in thiamine

From the time Williams and Cline first synthesized thiamine in 1936 until about 1945, it was widely and often indiscriminately used in medicine for many and various disorders In the past

few years, the pendulum has swung in the opposite direction and its use other than as a dietary supplement, has been largely neglected It is time that it be re-evaluated for many of its beneficial effects are not being used to advantage

The literature is almost devoid of references to the therapeutic use of thiamine in dentistry Many dentists are unaware of the many beneficial effects that may be obtained by its proper use It is hoped that these articles have given the reader sufficient experimental data clinical observations, and basic physiologic knowledge so that its therapeutic use will be intelligent and rational rather than empirical

CONCLUSIONS

Dental postoperative pain is promptly and completely relieved in most patients by the administration of thiamine Its prophylactic use materially aids in reducing the occurrence of postoperative pain Therapeutic results are best obtained by its parenteral administration

Besides relieving pain the healing time in dry sockets is greatly reduced by thiamine therapy Neuralgia and neuritis of long standing in which various degrees of degeneration have occurred require prolonged and intensive thiamine therapy Thiamine has a "curare like" effect on muscle and relieves the tonic spasms of trismus

Low pain threshold is peculiar to those patients suffering from painful dental conditions and may be indicative of thiamine deficiency Paralysis and paresthesia of nerves are greatly benefited by thiamine

In most patients dental pain is relieved promptly by the intraoral infiltration of 10 mg of the drug the results being equivalent to those obtained when 100 mg. are injected intramuscularly

The intraoral infiltration of thiamine invariably produces a transitory period of pain exacerbation which is directly proportional to the degree of pain already present. Hypersensitive teeth due to trauma mechanical irritation, deep scaling and curettage and operative dental procedures are greatly improved or completely relieved by thiamine Hypersensitive teeth due to caries and erosion are not materially benefited

It is not inconceivable that the loss of thiamine from the nerves is one of the major chemical factors in the production of pain There is ample evidence that the replacement of free thiamine to injured and diseased nerves not only restores proper functioning but relieves pain. It is not desired to imply that thiamine is the sole factor concerned in the production of pain

but it is believed that it is of prime importance in nerve physiology and that it should be given whenever injury, disease, avitaminosis, or degeneration of the nerves is suspected.

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Surgical Applied Anatomy by Sir *Frederick Treves* Bt 12th edition revised by *Lambert Charles Rogers* V R D M D M Sc F R C S F R C S E F R A C S F A C S Professor of Surgery University of Wales Director of Surgical Unit Cardiff Royal Infirmary Surgeon United Cardiff Hospitals Surgical Consultant to the Royal Navy Member of Council Royal College of Surgeons of England Formerly Member of Court of Examiners Royal College of Surgeons of England Prosector to the University of London and the Royal Colleges of Physicians and Surgeons and Examiner in Anatomy to the Conjoint Examining Board in London 590 pages illustrated Lea & Febiger Philadelphia Pa publishers 1953

Clinical Obstetrics by *Members of the Staff of the Pennsylvania Hospital* Edited by *Clifford B. Lull* M D Late Director Division of Obstetrics and Gynecology Pennsylvania Hospital and *Robert A. Kimbrough* M D Director of the Division of Obstetrics and Gynecology Pennsylvania Hospital Professor of Gynecology and Obstetrics Graduate School of Medicine University of Pennsylvania Gynecologist to the Graduate Hospital 732 pages illustrated J B Lippincott Co Philadelphia Pa publishers 1953

Unipolar Lead Electrocardiography and Vectrocardiography Including the Standard Leads the aV and V Leads the Cardiac Arrhythmias and the Principles of Vectorcardiography by *Emanuel Goldberger* M D F A C P Associate Attending Physician Montefiore Hospital New York N Y Cardiologist and Attending Physician Lincoln Hospital New York N Y Consulting Cardiologist St Joseph's Hospital Yonkers N Y Diplomate of the American Board of Internal Medicine Lecturer in Medicine Columbia University 3d edition thoroughly revised 601 pages illustrated Lea & Febiger Philadelphia Pa publishers 1953 Price $10

Acute Renal Failure Including the Use of the Artificial Kidney by *John T MacLean* M D F R C S (C) F A C S Assistant Urologist Royal Victoria Hospital Director of Urology Queen Mary's Veterans Hospital Department of Veterans Affairs Demonstrator in Surgery McGill University Montreal Canada 114 pages illustrated Charles C Thomas Publisher Springfield Ill 1952

Problems of Consciousness Transactions of the Third Conference March 10 and 11 1952 New York N Y edited by *Harold A. Abramson* M D Associate Physician for allergy The Mt Sinai Hospital New York N Y 156 pages illustrated Sponsored by the *Josiah Macy Jr Foundation* printed by Corlies Macy & Co Inc New York N Y publishers 1952 Price $3 25

Gyn cology Dis se d M or Surg ty c mp led nd ed t d by *R b t J Low* M A M D F A C S D-OG Associ t Cl nic l Prof s or of Obst tr s a d Gy cology Colleg of M d cin N w Y rk Uni ty Att nd g Gy ec l g t a d Ob t tri St V c t H sp ls *Att nd g Obstetr c n City H pit l W lfar I l d Att ding* Gy c l gi t W llard P rk H p tal Fo m ly Chairman Se t of Obst t ics nd Gyn logy New York Ac demy f M d c e New York N Y Co s lrant Gyn col gy and Ob t tr cs P ss c Ge er l H p t l P s ic N J F llow of th N w Y k Ac demy of M d ne F llow of th Am a P blic H lth As iat F rew rd by *Claud E H at n* M D 806 pag s llust ted Charles C Th mas Publishe Spr gf ld Ill 1952 P c $22 50

Gyne log cal nd Ob t tr cal P thology by *P t A H but* M D Prof s or f P th l gy J ffer Medi l Colleg a d Director f Cl l L bor tori J ff s M dic l C ll ge Ho p t l Ph l d lph P 683 p g s ll t ted Le & Feb g r Ph lad lphi P p bl h r 1953 P e $12 50

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The 1952 Y ar B k f Drug Th rapy (A g t 1951 Aug t 1952) d t d by *H rry B kr* M D D tor D partme t f Ph rma l gy Mar q tt U r ty Sch l of M d i d D t try C lr g *Phy ci M lw k Co ty G J nd Col mb H p t l M l* w ke W 606 p g ll t t d Th Y ar Book P blishe In Ch c go Ill 1952 P ic $5 50

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Rege rat and Wo nd H ling by *A E N db rn* M A B S U i r ty Dem tr tor Zo l gy U ty f Oxfo d 152 p ge ill st t d J h W l y & S In New Y k N Y p bli h s 1952

CARCINOMA OF THE PROSTATE

JAMES C KIMBROUGH *Colonel MC USA (1)*

CARCINOMA of the prostate develops in 3 ways (1) the cancer occurs in the posterior lobe in from 80 to 90 percent of the patients affected, (2) it develops diffusely in one or both lateral lobes in from 10 to 20 percent, or, (3) it is associated with prostatic hypertrophy Because the prostate of all men over 50 years of age undergoes hypertrophy (unless it is destroyed by infection) and the incidence of carcinoma increases after this age, it is only logical to assume that the occurrence of this disease is usually associated with such enlargement

INCIDENCE

Autopsy reports in men over 50 years old indicate that about 20 percent are afflicted with carcinoma of the prostate In a series of 513 patients treated at this hospital for prostatic hypertrophy and carcinoma of the prostate during the decade 1940 through 1949, 78, or 15 2 percent, had carcinoma *(2)* The high incidence of malignancy makes this disease an important factor in the Armed Forces (table 1)

TABLE 1 *Incidence of prostatic carcinoma in selected group at Walter Reed Army Hospital*

Year	Patients with		Total	Percent with carcinoma
	Benign prostatic hypertrophy	Prostatic carcinoma		
1940	42	10	52	19.2
1941	49	3	52	5 7
1942	29	4	33	12 1
1943	32	4	36	11 1
1944	26	4	30	13 3
1945	41	2	43	4 7
1946	50	7	57	12 3
1947	50	18	68	26 5
1948	59	14	73	19.2
1949	57	12	69	17 4
Total	435	78	513	15 2

(1) W lt R ed Army Hosp t l W h ngto D C.
(2) Kimbrough J C. and Rowe R B Carcinoma of prostate J Urol 66 373-378 Sept 1951

AGE

The average age in this series of 78 patients was 65 8 years (range 43 to 89) (table 2) Since 1950 two patients, 17 and 20 years old respectively have been treated for carcinoma of the prostate The average age of patients amenable to radical surgery was 65 2 years The youngest was 51 the oldest 74 years

TABLE 2 *Age distribution of patients with prostatic carcinoma*

Age of patients (years)	Number of patients	Percent
40-49	2	2 6
50-59	19	24 3
60-69	33	42 3
70-79	18	23 1
80-	6	7 7
Total	78	100 0

ETIOLOGY

The prostate is not an endocrine gland Its secretion contains organic material and enzymes The most important enzyme is acid phosphatase The evolution of the prostate is controlled, to a great extent, by hormones elaborated by the testes The testicular hormone imbalance resulting from senility is an important etiologic factor The incidence of cancer increases with age No explanation is attempted for its rare occurrence in young men Testosterone exacerbates the growth of carcinoma of the prostate The theory has been advanced that the use of testosterone for the male menopause as well as for other diseases increases the incidence of malignancy It will require much observation, however to clarify this conjecture

PATHOLOGY

Adenocarcinoma of the prostate is the most common type The acini may be small, numerous crowded and lined with a single layer of cells or they may be large and filled with malignant cells The scirrhous type shows infiltrating lines of aberrant cell groups Various types of squamous metaplasia of the acini may resemble cancer Mistaking such metaplasia for cancer may account for some of the long time cures attributed to the use of conservative measures In the younger patient the carcinoma is usually highly undifferentiated (anaplastic) and rapidly fatal.

EXTENSION BEYOND THE PROSTATIC CAPSULE

Extension by continuity to the urethra, rectum, and bladder The urethra is invaded most frequently and invasion may occur early Invasion of the bladder occurs later and affects the trigone first The trigone then presents a rigid corrugated appearance on cystoscopic examination Extension to the seminal vesicles occurs late The fascia of the vesicles is involved more often than the vesicles themselves Perineural invasion occurs simultaneously with the involvement of the seminal vesicles and accounts for the early sacral and lumbar pain Extension to the periureteric tissues may cause ureteral obstruction and hydronephrosis The rectovesical (Denonvilliers) fascia is a tough membrane and a barrier to rectal invasion Such invasion is rare and occurs only late in the course of the disease

Extension by the lymphatic system Lymphatic invasion takes place along the route of the lymph drainage, the seminal vesicles, rectum, and lymph nodes of the external and internal iliac chains and passes upward along the abdominal and thoracic vessels to the abdominal, mediastinal, and supraclavicular glands Rarely are the femoral and inguinal glands involved

Extension by the blood stream Any part of the body may be involved by blood stream extension The most common site is the sacrum, pelvic bones, and lumbar vertebras Later, the ribs and long bones may be involved The first metastasis observed is usually in the bones of the pelvis, the lumbar vertebras, and the lungs

SYMPTOMS

Symptoms occur late and indicate failure to perform a rectal examination early in the course of the disease They are due to local extension to the urethra, bladder, pelvic nerves, and rectum Frequency, difficult urination, and retention may occur, simulating benign prostatic hypertrophy Gross hematuria is usually a late occurrence

Lumbar pain and pain along the sciatic nerve may be the first symptom noted and is due to perineural involvement Rectal symptoms result from local extension and lymphatic metastases Very rarely, the first symptoms noted are due to metastases to distant parts of the body—the ribs, humerus, and other long bones Patients with these symptoms may be treated several months for arthritis and other diseases before an alert physician does a digital rectal examination All these symptoms occur late in the development of the cancerous process in the prostate Except in very rare instances, the disease can be detected by rectal

examination many months before symptoms appear When symptoms appear, it is usually too late for curative surgical extirpation and palliative conservative therapy is the only procedure available

EARLY DIAGNOSIS

Early diagnosis, established by digital rectal examination is the only procedure which will enable most patients with carcinoma of the prostate to be cured by radical excision When urinary symptoms appear only about 8 percent of the patients may be cured by operation Radical excision has been feasible in more than 66 percent of the patients at this hospital since 1946 In a great measure this has been accomplished by requiring digital rectal palpation in annual physical examinations Similar results could be attained in the civilian population by the proper publicity in the lay press emphasizing the fact that 1 in every 5 men over 50 years of age has cancer of the prostate which can be cured only by early diagnosis and radical excision. In cancer detection propaganda great attention has been given to carcinoma of the breast and other organs There is no excuse for neglecting carcinoma of the prostate in this publicity

In our series of 78 patients (2) digital rectal examination provided the most valuable information prior to operation Early in the disease, a hard nodule was the first sign As the carcinoma increased in size, the hardness extended the gland became fixed and nodular and encroached on the membranous urethra Later the induration involved the seminal vesicles and filled the intervesicular space

The rectal examination was negative for carcinoma in 6 patients, and the proper diagnosis was established by pathologic examination after operation In 2 patients a positive diagnosis by rectal examination was proved erroneous by perineal biopsy at operation or by pathologic examination Digital rectal examination was erroneous in less than 10 percent of the patients, and was considered the most reliable diagnostic procedure Roentgenograms of the bony pelvis lumbar vertebras thorax, and long bones showed metastatic lesions The perineal punch biopsy was used, but was often misleading unless the tissue for examination was removed from the cancerous area The diagnosis was established or confirmed by examination of the tissue removed in transurethral resection in 18 patients and was negative in 2 The specimen from the perineal punch biopsy was positive in 6 patients and negative in 2 Cytologic examinations were made in the past 3 years and were positive in a few patients Cystoscopy provided little information except in patients with advanced disease involving the trigone Increase in the serum acid phosphatase was noted with the presence of metastatic lesions

This increase was present in no other process Androgen estimations were not helpful Pain and urinary obstruction occurred late In 2 patients, the first symptom was pain from metastatic lesions Sternal or iliac biopsy specimens may show early metastases

The importance of the digital rectal investigation as a part of every physical examination in men over 40 years of age cannot be overemphasized Since 1946 this phase of the examination has been stressed in the Army physical examination A sharp rise in the number of patients with prostatic carcinoma found and a great increase in the percent amenable for radical extirpation have followed these rectal examinations

Differential diagnosis is not often difficult Fibrosis following infection, calculi, and tuberculosis, may be confusing Sarcoma is rare and may require a biopsy for final diagnosis, but these tumors are usually larger, softer, and occur in younger men

TREATMENT

Palliative treatment has been used in patients who showed evidence of metastases or local extension beyond the limits of a cure with radical excision In 1940 there were 10 such patients in this hospital, only 1 of whom could be cured by radical excision Palliative measures were used on the others At that time x ray therapy, sedation, and general care were the available measures In 1941, castration and estrogen therapy were initiated (*3, 4*) Five patients treated by these measures were bed ridden with advanced metastases and were suffering great pain The effect of castration and estrogen therapy was dramatic for the relief of pain, the recession of metastases, and the reduction in size of the prostate gland These patients, now dead, have been reported by Herbst (*4*)

In our series of 78 patients (*2*), 50 percent received only palliative therapy This therapy gave remarkable results in the relief of pain, recession of metastases, reduction in the size of the gland, and the prolongation of life Thirty one patients were treated by castration and 8 of these had radical excision A few refused castration and were treated by stilbestrol Because of their age (81 and 85 years), 2 patients were treated by conservative perineal prostatectomy Both were alive and well 5 and 6 years, respectively, after operation The most controversial phase concerning the use of estrogen therapy is the time when it

(*3*) Huggins C. and Hodges C. V Studies on prostatic cancer effect of castration of estrogen and of androgen injection on serum phosphatases in *metastatic carcinoma* of prostate Cancer Research 1 293-297 Apr 1941

(*4*) Herbst W P Thoughts and observations on relation of altered hormonal balance to prostatic malignancy Urol & Cutan Rev 46 691-694 Nov 1942

should be begun At this hospital, estrogen therapy plus cast tion is initiated as soon as it is established that there is ext sion of the malignant process beyond the possibility of surgi eradication

Estrogen therapy and castration are used simultaneously has been established that castration plus estrogen therapy gi much better and more rapid results than estrogen therapy alc It is realized that estrogen therapy may eventually become ir fective and may have a definite therapeutic time span and i delaying this therapy until it is required for the relief of p may give the patient greater longevity than it would if used the early treatment It is believed, however, that the ea this therapy is begun, the better will be the results

Transurethral resection for the relief of obstructive sympt and for diagnostic purposes was used in 18 patients The decr in the size of the gland following estrogen therapy reduced number of patients requiring transurethral resection for the re of obstruction Prefrontal lobotomy was performed with good sults in 3 patients In 2 others a cystostomy drain was necess X ray therapy was practiced when other agents failed The sl est duration noted for the effectiveness of estrogen therapy 18 months The patient died of metastases 2 years after cas tion and the use of stilbestrol The response was not remarka and the agent lost its effectiveness for the relief of pain pain in this patient was controlled by prefrontal lobotomy

Bony metastases has been affected very little by estro therapy Metastases to the lung in some patients, however, h disappeared

Hormonal therapy appears to have a definite period of ef tiveness varying with the type of carcinoma the age of the tient and the time such treatment was begun Eventually adrenals hypertrophy and compensate for the loss of the gon and thereby neutralize the estrogen administered

Chlorotrianisene an estrogen product is reputed to cau e adrenal hyperplasia but its value is not yet definitely es lished

Bilateral adrenalectomy has been used to relieve the pai terminal cases when castration and estrogen therapy no lo are effective A patient with an adrenalectomy may be car satisfactorily on a daily maintenance dose of from 25 to 50 of cortisone Because of the good results of palliative thera radical excision is not advised in patients over 70 years of and with less than 3 years of life expectancy Castration estrogen therapy gives better results than either used alo

Gold isotope, according to the tech being tried but so far has not been used a tion therapy has been used to relieve pa tensive metastases

Curative Complete surgical excision tures is the only means which will effect is made possible by early diagnosis Rad been performed on 39 patients in this s proach was used in 38 and the retropubic number and percentage of patients who

TABLE 3 *Number and percent of patients*

Year	Patients with prostatic carcinoma	Patients perineal p
		Number
1940	10	1
1941	3	0
1942	4	0
1943	4	1
1944	4	2
1945	2	2
1946	7	3
1947	18	13
1948	14	9
1949	12	8
Total	78	39

Usually the diagnosis was made by the nodule Following the success of estrogen size of the gland, the indications for re tomy were extended to include prostatic limits by such therapy *(6)* It is too ear the effectiveness of this type of treatm showed no extension beyond the parts re other therapy was used When the patho showed definite evidence of extension of

(5) Fl ks R. (Iowa City Univers ty H pital) Pe (6) Col t J A C and Be ndl r H Endocr at J A M A 134 848-853 July 5 1947

the surgical excision, castration was performed and estrogen therapy was begun soon after radical operation (7)

Eight patients in this series were treated by castration—1 in 1944, 1 in 1947, 3 in 1948 and 3 in 1949 With the growing interest in early diagnosis in the past 3 years the patients selected for radical excision have increased markedly At present about 10 percent of the patients are considered amenable to such treatment This compares favorably with the optimistic predictions of Gutierrez (8).

PROGNOSIS

The prognosis depends on (1) the age of the patient at onset (2) the type of lesion present, and (3) the time in the course of the disease when treatment is begun

In patients under 50 years of age the prognosis is uniformly poor unless early detection makes radical extirpation feasible The 2 young adults reported earlier, rapidly progressed to death in spite of castration and hormone therapy Another patient 43 years of age, had little relief and no arrest of the progress of the lesion Patients over 65 years of age have little curtailment of activity or prolongation of life with such treatment The patients given hormonal and castration treatment in 1941 1942 and 1943 were in the terminal stage of their disease and have since died One patient survived for 10 years on palliative treatment which was begun in 1941 Others survived 8 years or less

The type of lesion is important in the prognosis Those patients who have squamous metaplastic tumors survive the longest—so long in fact that the original diagnosis of malignancy is questionable The elderly patients who have adenocarcinoma with small acini do very well Anaplastic (highly undifferentiated) tumors are usually found in young patients and such patients have little life expectancy regardless of the type of therapy given

The time in the course of the disease when treatment is begun is the most important factor in the prognosis Cancer of the prostate, like cancer in other parts of the body, is curable if recognized early enough for total surgical extirpation to be carried out

Under the Army regimen of annual physical examination with rectal examination about 60 percent of the patients admitted to this hospital have been amenable to cure by radical excision

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(7) Hugbe D R Status f pe ne l pr t my od y J A M A 139 141 144 J 15 1949

(8) G t rr z R New horiz ns in urg cal manag me t f in ma f prosta gland Am J Surg 78 147 169 Aug 1949

The rest were mostly retired personnel who were not seen until symptoms appeared—too late for cure

The period of observation has not been sufficient to evaluate the results of radical excision, but the indications are that about 85 percent of such patients will survive until other causes terminate their lives Estrogen therapy instituted 3 or 4 weeks prior to operation renders doubtful cases amenable to cure by radical excision The complications and sequelae following operation are inconsequential when the question of cure is concerned When the occasional urinary incontinence, impotence, and other postoperative complications are evaluated, these are a small price to pay for the cure of such a dreadful disease as cancer

CONCLUSIONS

Early detection by digital rectal examination is the most important factor in the therapy of carcinoma of the prostate In patients who are in the advanced stages of the disease and therefore incurable by extirpation of the prostate, castration plus estrogen therapy gives the best results This type of treatment should be instituted early in the course of the disease Bilateral adrenalectomy has a definite place in relieving pain and prolonging life in terminal cases

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BOOK REVIEWS

Gynecologic and Obstetric Pathology With Clinical and Endocrine Relations by *Emil Novak* A B M. D D Sc (Hon. Trinity College, Dublin Tulane) F A C S F R C O G (Hon.) Assistant Professor Emeritus of Gynecology The Johns Hopkins Medical School Gynecologist Boa Secours and St Agnes Hospitals Baltimore Md Fellow and Past President American Gynecological Society 3d edition 595 pages 630 illustrations 19 in color W B Saunders Co Philadelphia Pa publisher 1952

Because of rapidly expanding knowledge in the field of gynecologic and obstetrical pathology, particularly relating to neoplastic diseases, many additions have been made in this text Most noteworthy is the discussion of cervical carcinoma in situ which is much more comprehensive than that found in the previous editions The extremes of physiologic change often associated with pregnancy are also carefully described Although the diagnosis of uterine cancer by vaginal smears is also included the author is not enthusiastic about this technic except in the hands of a few experts The chapter on hydatidiform moles and chorionepithelioma malignum has been extensively

rewritten and is now an impartial presentation of the current controversy between Hertig and the author concerning the malignancy of these lesions Novak s classification of ovarian tumors remains essentially unchanged but the discussion now includes paragraphs on gynandroblastomas virilizing hilus cell tumors and on the homology of certain ovarian and testicular tumors In the chapter on placental abnormalities a whole new section is devoted to premature separations In response to popular demand, the author has added a chapter on the common breast lesions of gynecologic interest

This text has always served admirably as an atlas because of the many excellent illustrations Nearly 100 new ones have been added In the preface the author describes himself as a clinician with pathology as a hobby Modestly he does not mention that as a hobbyist he is consulted perhaps more often than any other pathologist in his field Only experience as extensive as his could produce such a book It is believed indispensable in the library of the gynecologist and the general pathologist It is also heartily recommended to the general practitioner and to the medical student meeting this fascinating but vexing subject for the first time —*Lt Comdr T R Mafit MC USN*

The 1952 Year Book of Medicine (May 1951 May 1952) dited by *Paul B Beeson* M D *J Burns Amberson* M D *William B Castle* M D *Tinsley R Harrison* M D *George B Eusterman* M D and *Robert H Williams* M D 735 pages illustrated The Year Book Publishers Inc Chicago Illinois published 1952 Price $6

This year book abstracts the literature in internal medicine for 1951 under the following divisions (1) infections (2) the chest, (3) the blood and blood forming organs (4) the heart and blood vessels and the kidney (5) the digestive system and (6) metabolism The latter is included in this year s review for the first time The editors have presented articles that portray the most recent advances Many controversial articles are included and they are clarified by the excellent editorial comments which are one of the best features of this book There is an especially good review of the current status of the drugs effective against tuberculosis This book is particularly recommended to all physicians who wish to keep abreast of the voluminous literature on internal medicine

—*Lt Col T A Haedicke MC AUS*

THE USE OF MELAMINE FORMALDEHYDE IN THE APPLICATION OF CASTS[1]

AUGUST T SPITTLER *Colonel MC, USA*
JOHN J BRENNAN *Lieutenant Colonel MC, USA*
JOHN W PAYNE *Major USAF (MC)*

SINCE the first use of plaster in immobilization of fractures and associated injuries, attempts have been made to improve the agents used in the application of casts and splints Various substances have been studied at this hospital with a view toward increasing the strength and durability and reducing the weight and bulk of plaster casts. Since February 1951, we have studied the combination of melamine formaldehyde (MF) plastic resin with plaster of paris

MF powder is mixed with water to make a 30-percent solution by weight just prior to the soaking of the plaster bandage. Thorough stirring by hand is required to assure an even mixture. To this solution, an amount of ammonium chloride equal to 3 percent of the weight of the MF is added as a catalyst to speed setting Although 0 5 percent by weight of alum will speed setting, this catalyst reduces the "pot life" (stability) of the solution Three percent by weight of sodium chloride was found to be as good a catalyst as ammonium chloride The addition of a catalyst is not necessary Rolls of plaster may be soaked in a pail of solution until all the solution is absorbed without changing the quality of the resultant cast as long as soaking is within the time limits of the solution's pot life In this series, the hard-coated, fast-setting acetic acid free plaster prepared for use in the Armed Forces was used. MF in a 50-percent solution may be stored for 2 weeks or more without loss of stability but should be diluted to 30 percent before it is applied to a cast. It goes into solution in a range of from about 20 to 65 percent. Higher concentrations produce a brittle cast and lower concentrations are ineffective

The disposal of plaster residue containing MF presented a problem because it had a greater tendency to plug the disposal sink than plaster in water This has been solved by using a wax

(1) Walte Re d Army Ho pital Washington, D C.

bag in the mixing pail and disposing of only the liquid portion i the sink. The precipitate in the wax bag is disposed of as soli waste

TABLE 1 *C mpa ative strength of plaster ca ts*

Layers in splint	S z of depre ion (mm)	
	Plast r i wat r	Plaster in MF solutio
8	3 5	0 5
6	4 5	1 0
4	5 0	1 5
2	5 8	2 0

The stability of solution, setting time, drying time, strength of casts, water resistance, and penetration by x ray were studied The materials used were plaster splints of 2, 4 6, and 8 thick nesses, each thickness measuring 4 by 15 inches All splints were made by the same investigator to assure equal quality and consistency The strength of MF impregnated splints as compared with plain plaster splints was measured by exerting a 60 kg weight at a constant and equal pressure using the Rockwell hardness tester The diameter of the depression made by the ball point was then measured to indicate the resistance to depression (table 1)

TABLE 2 *C mparat ve tab l ty of sol t s of MF*

Pe od of oak g (m nute)	Quality f pl t
0	E llent
15	Exc ll t
30	Ex elle t
45	Ex ellent
60	Exc ll nt
75	Good
90	Good
105	Good
120	F ir
135	Poo
150	Poor

Pot life was measured by soaking plaster splints in MF solu on for varying periods to determine how long after mixing the olution it was still effective (table 2)

Setting time was measured by making identical splints of laster soaked in water and in MF solution, timing each to the oint of setting The setting time was found to be almost identi al The tensile strength of those made with MF at the time of etting was much greater than that of those made with water eat in the range between 90 and 100° F equally influenced ach Baking at a temperature of 140 F produced quicker drying ith MF solution than with water At temperatures over 140° F , e MF casts became too brittle for use (table 3)

TABLE 3 *Comparison of drying time of casts at 140° F*

Layers in splint	Drying time (hours)	
	Plaster with water	Plaster with MF
8	12	6
6	8	4
4	6	2
2	3	1

Water resistance was tested by soaking equally dried splints f the same thickness and consistency of both plain plaster nd MF soaked plaster Splints of 4 and 6 thicknesses were sed Splints of plain plaster were soft after 5 minutes, pliable fter 10 minutes and completely useless after 20 or 30 minutes f soaking Splints made with MF were still firm and retained eir shape and strength at the end of 7 days of soaking

X ray penetration was not affected by the solution, but the eduction in thickness obtained by using MF solution resulted n better detail

A series of 52 casts were applied and followed by the same nvestigator throughout the study The results are shown in able 4 Each splint consisted of 3 layers 3 inch splints were 5 inches in length, 6 inch splints were 32 inches in length Rolls of plaster were either 3 4, or 6 inches wide and 5 yards ong All plaster used was of the hard coated, fast-setting, specialist type, free of acetic acid Casts were applied in a standard manner using both padded and skintight technic Several of the casts were case hardened" by rubbing the precipitate in the bottom of the pail on the exterior of the cast to produce a glazed waterproof exterior Several of the casts after setting

bag in the mixing pail and disposing of only the liquid portion in the sink. The precipitate in the wax bag is disposed of as solid waste

TABLE 1 *Compa tive st engtb of pla ter casts*

Layer in plint	S ze of depre on (mm)	
	Plast r in wat r	Pl ste in MF olution
8	3 5	0 5
6	4 5	1 0
4	5 0	1 5
2	5 8	2 0

The stability of solution setting time, drying time strengt of casts, water resistance, and penetration by x ray were studied The materials used were plaster splints of 2 4 6 and 8 thick ne..ses each thickness measuring 4 by 15 inches All splint were made by the same investigator to assure equal quality an consistency The strength of MF impregnated splints as compare with plain plaster splints was measured by exerting a 60 kg weight at a constant and equal pressure using the Rockwe hardness tester The diameter of the depression made by the ba point was then measured to indicate the resistance to depressi (table 1)

TABLE 2 *Comparat v st b l ty f olut on of MF*

Per od of so k ng (m ut s)	Qual ty of pl st
0	E ll t
15	Ex ell t
30	Excelle t
45	Excell nt
60	Ex ll nt
75	Good
90	Good
105	Good
120	Fair
135	Poor
150	Poor

TABLE 4 *Results obtained with 5% MF soaked plaster casts* —Continued

Patient	Age (years)	Diagnosis	Type of cast	Time worn (days)	Splint		Rolls			Remarks	Complications
					3 in.	6 in.	3 in.	4 in.	6 in.		
1	28	FCC of right humerus	Shoulder *spica*	42		4			6		0
4	28	FCC of right humerus radius and ulna	Shoulder *spica*	42		3			6		0
12	28	FCC of right humerus	Shoulder *spica*	28		2			4		0
16	28	FCC of right humerus radius and ulna	Shoulder spica	42		3			4		0
23	30	FCC of right humerus	Shoulder spica	28		2			3		0
27	21	Recurrent dislocation of right shoulder (Bankhart repair)	Shoulder spica	42		3	2		3		0
32	21	Recurrent dislocation of right shoulder (Bankhart repair)	Shoulder spica	28		2	2		2		0
46	24	FCC of left humerus	Shoulder *spica*	42		2	1		2		0
11	18	FSC of medial malleolus	Boot	28		2		3			Dermatitis
25	18	Amputation (Syme's)	Boot	42		1	1		1	Walker	0
33	28	*Triple arthrodesis*	Boot	28		1	1		1	Walker	0
41	20	*Amputation* (Syme's)	Boot	42		1	1		1	Walker	0
42	20	Amputation (Syme's)	Boot	28		0	0		1	Mild stump	0

TABLE 4 R l w th 52 MF oak d pla t cast —Conti d

P t t	Ag (y ar)	D g	Typ f t	T m worn (day)	Spll		R ll		R mark	C mpl ti
					3	6	3	4 6 i		
43	28	T pl rthrod	Boot	42	0	0	1	N w lk r		0
47	21	FSC f m dial m ll lus	Boot	42		1	1	W lk		0
9	20	FSC f l ft h m FSC f rxth cal b	Hyp t m p	42	5		10			0
36	45	Sp l fus	Body d l f h gh	56	3	2	4			0
37	23	Sp l f	Body	56	2		2			0
38	23	Sp l f	Body	28	2		2			0
29	15	P t p l my l l l V t b l fus th t d f ths d lumbar	Head body d l ft h gh	56	4	5		H s w dg d		0
20	23	A m l lar p	V lp	42	2		4			0
21	25	R ur t d l n f ight hum us	V lp	42	2		4			0

TABLE 4 *Results obtained with 52 MF soaked plaster ca ts* —Continued

Patient	Age (years)	Diagnosis	Type of cast	Time worn (days)	Splints		R II			Remark	Compli cations
					3 in	6 in	3 in	4 in	6 in		
22	23	Recurrent dislocation of right humerus	Velpeau	42		2			4		0
18	1	Congenital dislocation of hip	Frog leg	28	2		2		2		0
39	5/12	Congenit l dislocation of hip	Frog leg	28	2		2		1		0
44	1	Congenit l disl cation of hip	Frog leg	28	2		2	1			0
24	21	Fracture of left navicu lar	Gauntlet	28	1		2				0
28	14	FS of right radius	Long arm	42	1		2				0
34	21	FCC of left radius and ulna	Long arm	28	1		2				0
19	3	Congenital dislocation of hip Open reduction of left hip	Hip spica	28		2		6			0
40	2	Arthroplasty of right hip	Hip spica	14		2		1	3		Dermatitis

TABLE 4 *R s lt bl w t 52 MF so k d pla t ast —C t n ed*

P i t	Ag (y)	D g	Typ f c t	T m w rn (day)	Spl t		R ll			R ma k	C mpl t
					3 n	6	3	4	6 n		
30	4	T i ll	J k t (h d a d body)	14		2		2	2		D m t s
31	5	T tl lli	J k t (h d d body)	14		2	1	1	1		D m t t
26	28	F ctur f i h d th c l d f ur h d f f h h ra c rt b	M n rv	42	2	1	1		2		0
45	20	F ctur f f f h nd ixth r l te- b	M	42	2	2		1	4		0
49		M d n r jury	Opp n	56	1	1	1 lay 15				0
50		FS f ight radi d ulna	S ga g	28	1	2	21 y r 32				0
51		Sp f w st	C k p	56	1		11 y 15 n.				0
52		FS f d	P t o pl t	56	1		21 y 32				0

Co di n m l f tw c ll t n llp e t
FCC F tur mp und mmi d
FSC F ur mpl mm d
FS F ur mpl

Dermatitis developed in 3 of the 7 children in the series Patch tests for sensitivity to (a) plaster, (b) MF, and (c) formaldehyde revealed sensitivity for plaster only As none of these children developed dermatitis on reapplication of casts without MF, it was believed that the lowered porosity of the casts may have been a factor The 18 year old patient who developed dermatitis showed a sensitivity to MF

Removal of the casts both by electric cast cutter and by hand was more difficult because of the hardness When using MF, extra care should be taken to avoid making casts too heavy The best use was in casts and splints for long term wear

CONCLUSIONS

Plaster of paris soaked in melamine formaldehyde produces a stronger cast with reduced weight and bulk No change in technic is necessary The casts produced are superior to ordinary plaster casts in resistance to moisture and soiling They are satisfactory for wedging in correction of deformities They are more difficult to remove with hand cutter, cast knife, or electric cutter MF plaster residue should not be disposed of in the sink. Dermatitis occurred in 4 of 52 patients, 1 of whom was found to be sensitive to MF

BOOK REVIEWS

The Moral Theory of Behavior A New Answer to the Enigma of Mental Illness by *Frank R Barta* M D F A C P Director Department of Psychiatry and Neurology Creighton University School of Medicine and St Joseph s Creighton Memorial Hospital Omaha Neb Publication Number 163 American Lecture Series A Monograph in American Lectures in Medicine 35 pages illustrated Charles C Thomas Publisher Springfield Ill 1952 Price $2

As the title indicates, this monograph deals mostly with the theoretical aspects of mental illness rather than with its practical management. The author believes that without a theoretical framework, the therapist is handicapped in understanding man's basic difficulties in living and is apt to fall back on the more empirical methods of therapy In a logical and orderly presentation he outlines a theory to explain human behavior (normal and abnormal) based on the philosophy of Aristotle and Aquinas and correlates this not only with the temperamental typologies of Hippocrates, kretschmer, and Sheldon but also with his own experience in clinical psychiatry Because the present theory was

first publicly presented in 1948, we cannot but admire the deep convictions that impelled the author to advance his bold thesis on the basis of only 6 years practice as a licensed physician Nonetheless wisdom is not a prerogative of the aged and the author does display great ability as a philosopher Man s basic relationship is seen as that with God man s relationships to creatures is viewed in the light of whether he expects too much or too little from others and also whether he expects too much or too little from himself In this way a tetrachoric correlation is worked out that constitutes the basis for 4 personality types

The designation of temperament as learned attitudes sug gests the behavioristic terminology, but this objection is more apparent than real because the author does not use the term tem perament (as is usually done in present-day psychology) to de note the innate factors determining a person s basic emotional physiologic and kinetic responses As regards therapy based on this theory the role of re education is stressed to the neg lect perhaps, of appreciating the potent emotional factors opera tive in any patient-physician relationship The claims of rapid recovery of psychoneurotics after only a few therapeutic ses sions should arouse in most psychiatrist a desire for a more de tailed account Unfortunately this profound thesis with its im portant implications can scarcely be presented adequately in so brief a monograph This book will not appeal to those who lack a philosophical bent but to those who seek a more adequate answer to the meaning of man s existence it will provide a stim ulating and thought-provoking challenge

—*Capt J F McMullin MC, USN*

1 1952 Y Book of Pediatri (J 1951 M y 1952) ed t d by *Sydney S Gellis* M D As ista t Prof of P diatrics H rv rd M d al S h l S Phy Child M d c l Cent Bo to P dia t ian- -Ch f B th I rael Ho p tal B t n *I a A Abt* M D Ed t Em tu 423 p g ll u t d Th Y Book P bl h s *I* Chi go *Ill* p bl h *1952 P* $5 50

The arrangement of subjects and table of contents of this book is been kept practically the same as in previous years One improvement made by the new editor is the inclusion of editorial notes with some of the abstracts These not only give the edi tor s viewpoint but also the opinion of experts on the subjects discussed The illustrations throughout the book are generally excellent I should like to see chapters on the 2 subjects which now have the highest mortality in infants and children, namely cancer and accidents —*Captain S J Winter MC USN*

ROENTGENOGRAPHIC VISUALIZATION OF THE SPLEEN

PETER ZANCA *Colonel MC, U S A (1)*

VISUALIZATION of the shadow of the spleen is successfully accomplished through the use of roentgenographic procedures The splenic outline and shadow are clearly visualized when a lienographic examination is made with thorotrast or with ethyl diiodostearate and when contrast studies are made following pneumoperitoneum and by extraperitoneal pneumography Recently Zelman *(2)* has described a simple contrast method for the visualization of the liver and spleen. By increasing the gaseous content of the stomach and injecting air into the colon, sufficient contrast is obtained for the proper visualization of the splenic outline This is accomplished by giving the patient a glass of carbonated water and by injecting air into the colon through a rectal tube This, briefly, is Zelman's technic which we have modified and used for the past year at this hospital

TOPOGRAPHIC ANATOMY

The spleen lies directly under the diaphragm at the level of the ninth, tenth, and eleventh ribs Anteriorly and medially it is in contact with the greater curvature of the stomach, laterally it extends to the abdominal wall and its inferior margin rests on the splenic flexure of the colon It varies in size according to the patient's physique but the inferior pole of the spleen reaches the level of the costal margin and it is this portion of the spleen which may be palpable. On the plain roentgenogram of the abdomen it is possible to see the splenic shadow only when the spleen is unduly large or when an impression is made on the gas filled stomach and on the splenic flexure In an appreciable number of patients the spleen occupies a lateral position in the left upper abdominal quadrant (fig 1) The splenic shadow can be visualized on the routine chest film in patients who at the time of examination happen to have a moderate amount of gas in the stomach and in the splenic flexure of the colon (fig 2)

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(1) U S Army H pit l Camp Cooke Calif

(2) Zelman S L r nd pl e v ualiz tion by simple r enta n contr st method Ann. Int. Med 34 466-478, F b. 1951



Figure 1 Roentgenogram how g the later l po tio occup d by the pl en the l ft pp abd minal quad a t



F gur 2. V ual zat on of th pl n c shadow o the out roe ig n gram of the be t.



Figure 3 Roentgenogram showing splenic shadow between the stomach and the splenic flexure of the colon.

TECHNIC OF EXAMINATION

The preparation of the patient is that commonly given for the routine barium enema One ounce of castor oil is given at about 1600 hours on the day prior to the examination The patient has a light supper and is given a tap water or normal saline solution enema at 2200 hours The enema is repeated on the morning



Figure 4 Roentgenogram showing the outline and position of the spleen

of the examination. The patient reports to the x ray department at 0800 hours He is given a glass of carbonated water (Vichy water Seidlitz powder, or a carbonated beverage) Using a rectal tube and a hand bulb enough air is injected into the colon under fluoroscopic control to reach just beyond the splenic flexure Roentgenograms of the abdomen are then taken in the upright (fig 3) and supine anteroposterior (fig 4) positions The left anterior oblique projection (Benassi position) should be used to demonstrate the greater surface of the spleen (3) The technical factors employed are a target to film distance of 36 inches, a Potter Bucky diaphragm 100 milliamperes, 66 kv for 20 cm body thickness, and a 3/4 second exposure The umbilicus is centered to the midline of the cassette and the central ray is directed between the second and third lumbar vertebras For the oblique view the kilovolts are increased by 4 and the xiphoid process is centered to the midplane of the film The central ray passes through the center of the film.

Following the above-described technic, we have been able to demonstrate the normal and abnormal splenic shadows

(3) Mer ll V Atls f Roe g gr ph Pos t n C V Mo by Co S Lou M 1949 L 2 p 537

BOOK REVIEW

o t-Graduate Lecture o Orthop d c Diagno is and Ind cation Vol m IV by *Arthur Ste ndle* M D F A C S Prof sso of Orthop d c S r gery State U v rs ty of I wa low C ty I wa Se ti A Arthrit s d D e s s of Mus l s B s e T nd n d Fa ia S t on B Def c n y a d D g n rat D e ses of th Loc m tor Sy t m 312 p g ll tra ed Charles C Thoma Publi h r Spr ngf eld Ill 1952 Pri e $9 75

This volume is a tribute to the author s writing and teaching ability and also to his knowledge of his subject Section I deals with arthritis and diseases of muscles bursas tendons and fascias, Section II deals with deficiency and degenerative diseases of the locomotor system Emphasis is on the pathology, clinical signs and symptoms, and treatment for each disease discussed The photographs and photomicrographs are of excellent quality Although these lectures are for students of orthopedic surgery general practitioners internists and others called on to treat the above conditions should find this volume to be of great value —*Lt Col R D Anderson MC USA*

CLINICAL EXAMINATION OF ACUTE TRAUMATIC FACIAL INJURIES[1]

JACK B CALDWELL *Colonel DC USA* [2]

THE first opportunity for examining acute traumatic facial injuries occurs when the patient is admitted to the receiving ward of a hospital As a rule, he is first seen by a medical intern or a resident physician If there is even the slightest evidence of trauma to the face, the skeletal structures should be examined carefully Internal injuries, fractures, or head injury with brain damage take priority in treatment over accompanying facial injuries Occasionally trauma to facial bones is underestimated or overlooked altogether because the seriousness of other injuries may take the entire attention of the examining doctor, and because in our trend today toward specialization we have condoned, if not encouraged, younger men to neglect phases of medicine, surgery, or dentistry in which they are not primarily interested The admitting doctor must accurately evaluate all injuries, including facial, and record his initial clinical impression when the patient is first seen Based on the results of this first analysis, consultants from appropriate services should be called

The primary objectives in the treatment of traumatic injuries of the facial bones are (1) restoration of normal function of the jaws, (2) restoration of normal occlusion of the teeth (3) prevention of facial disfigurement, and (4) early return of the patient to duty To attain these objectives, careful treatment planning is essential To formulate a plan of treatment accurate diagnoses must first be made After consideration of emergency treatment i e , establishment and assurance of an adequate airway, control of hemorrhage and treatment of shock the first step in the diagnosis of traumatic facial injuries is a careful clinical examination If the admitting physician finds evidence of fractures of the facial bones, he may not wish to complete the examination but may call for consultation

(1) Pr t d at the Third Annual M dicomil tary Symposium, U S Naval Hospital Ph l delph Pa on 21 October 1952

(2) Walt r R d Army H p tal W hington D C.

The care of fractures of the facial bones is rarely an emergency and definitive treatment may frequently be deferred for a few days Occasionally however it is advantageous, or necessary, that some form of treatment be accomplished early Facial deformities or subsequent reconstructive operations can be prevented in many instances by early diagnosis and adequate treatment This can be accomplished only if the examining physician has ascertained the nature and extent of the injury and taken steps to place the patient in the care of the service concerned

An accurate history is important in establishing a diagnosis and is equally valuable in the evaluation of traumatic injuries Occasionally it is impossible to obtain a complete history because the patient is unconscious

VISUAL EXAMINATION

Visual examination may disclose facial deformity caused by swelling from trauma of the soft tissues or the displacement of skeletal structures This is not a diagnostically reliable sign however because edema and cellulitis associated with trauma may be present in the absence of fractures In fractures with moderate to severe displacement obvious deformities are diagnostic Middle facial injuries, for example frequently produce the gross deformity commonly referred to as dish face " Depression of the zygoma and fracture of the zygomatic arch are often obvious but if they are obliterated by swelling they may be overlooked

Ocular signs particularly diplopia suggest fracture of the xilla involving the floor of the orbit Paralysis of the ocular uscles can be caused by a depressed fracture of the zygoma which results in impingement on the third fourth or sixth cranial nerve The presence of cerebrospinal fluid in the nose or ear is an indication of basal skull fracture usually a result of trauma to the middle face with associated fractures of the maxilla

Ecchymosis is usually seen adjacent to fractures but may be present even though fracture has not occurred Abrasions contusions and lacerations of superficial tissues are definite signs of trauma but are sometimes seen in the absence of fracture Their presence warrants investigation of underlying skeletal structures

Occlusion or malocclusion, is one of the most significant factors in the clinical diagnosis of jaw fractures Any discrepancy in occlusion associated with a history of trauma warrants further investigation Usually, malocclusion in fractures is sufficiently gross to be obvious but it is misleading because it may be primary in some cases Another factor which also may be misleading is the absence of teeth or the presence of grossly carious

or fractured teeth Laceration of the mucosa with or without the protrusion of bone fragments is an indication of open fracture

Impairment of function is not present in all patients with fracture of the facial bones, but if present it is usually a reliable sign The exceptions are trauma to the temporomandibular joint or the muscles of mastication, in which case inflammatory changes and trismus may alter normal function in the absence of fracture Inability to open the mouth normally, or to close the mouth completely, should always be viewed with suspicion

DIGITAL EXAMINATION

Marked tenderness over the injured part can be elicited even with gentle palpation This is an excellent indication of fracture, but it is not diagnostically reliable Mobility of fractures may be demonstrated by careful examination even in the presence of pain, and, if present at any point in any of the facial bones (except for the temporomandibular joint) may be considered a reliable sign of fracture Crepitus may be felt during the examination, but it is harmful to manipulate a fracture simply to demonstrate this condition Loss of contour or disruption of continuity may be felt even in the presence of swelling This ranks with mobility as a diagnostic sign

Gross or obvious injuries to the facial bones are almost always recognized Because more obscure fractures should also be found, this type of injury will be discussed in more detail If there is any evidence suggesting trauma about the face, even though no gross or obvious evidence of fracture is present, the following procedure is suggested

1 Using tongue blades to retract the lips, inspect the oral cavity for signs of fracture Examination of the occlusion is an excellent aid in the clinical diagnosis of fracture of the jaws, but when the patient is instructed to occlude his teeth, he is apt to place them in an incising position, which is not helpful because abnormalities or discrepancies in occlusion will not always be revealed in this way Therefore, he should be directed to close on his posterior teeth He will then shift his lower anterior teeth back of the upper teeth and bring all posterior, as well as anterior, teeth into occlusion unless a fracture is present. If there is no visual evidence, proceed with the digital examination

2 Place the forefinger in the buccal sulcus and palpate gently but firmly along the lateral surface of the body of the mandible With the other hand, and at the same time, the lower border should be palpated extraorally Fractures in the body, or at the angle of the mandible, can almost always be felt If there is any question as to whether a fracture exists the bone should be grasped

and hospital administrators responsible for the functioning of maternity units There is a complete section devoted to the technic of delivery in the home an art fortunately on the decline but still practiced of necessity in rural areas The chapter on *the mental hygiene of pregnancy is of particular value as it* stresses a type of problem frequently encountered usually not recognized and often mishandled Although this volume is of primary interest to nurses, it would also be of practical value to the physician practicing obstetrics in a rural area or setting up a small obstetrical unit of the type becoming so prevalent with the growth of group practice

—*Commander A G Simpson MC USN*

U de tanding Old Age by *J a e G G lbert* Ph D D plomate n Cli l P ychology Am can Bo d of Ex min rs i P f onal P ychology L cture in P y h logy F rdham Un ty Graduat S h ol a d L ng I la d Uni ity Grad t S h l 422 p g The Ronald Press Co N w York N Y p bli he 1952 P i e $5

This book is concerned with various physical and psychological changes generally associated with advanced age The first part deals with so called *normal changes* i e *those which can be* observed in everyone to some extent These are discussed under the terms physical endocrine emotional intellectual and motor and social relations The second part considers such abnormal changes as *common disabling physical conditions psychoneuro* ses and psychoses The final part deals with practical ap proaches to professional work with the aging generally in the community and in institutions Name and subject indexes are *and extensive bibliographies appear at the end of the* chapters

The exposition is handled skillfully throughout and there can be little doubt that the author has done a great deal of reading and thinking about aging but what began as a well documented factual survey soon deteriorated into uncritical psychoanalytic fancy One exception to this is the chapter on intellectual and motor changes in which the major experimental contributions are acknowledged, albeit without critical appraisal An occasional statement is frankly naive such as The individual with a neuro tic constitution or neurotic temperament has a hereditary make up which is sensitive and high strung so that he cannot readily withstand the vicissitudes and stresses of life (p 235)

I agree with the author that the book may be useful to the physician the nurse the social worker and institutional per sonnel *Part III especially abounds in common sense* This is not a book for the researcher in gerontology

—*Maj R B Payne USAF (MSC)*

THE RELATIVE EFFICACY OF CULTURES FOR SHIGELLA[1]

ALBERT V HARDY M D [2]
DON MACKEL M S [3]
DWIGHT FRAZIER M S [3]
DAVID HAMERICK Ensign MSC USN

MULTIPLE examinations proved necessary to provide dependable laboratory findings in enteric infections occurring among Korean prisoners of war Three diagnostic specimens were collected from each patient for bacteriologic examination In unselected groups of patients these were obtained by different methods, thus providing an opportunity to evaluate the relative efficacy of cultures on passed specimens, material collected by rectal swabs, and that taken during sigmoidoscopic examination

In the camp where this study was made, amebic dysentery, salmonellosis, and shigellosis were occurring simultaneously Many persons had been ill for several days before admission to the hospital and shigellas were present in comparatively small numbers in these patients with ulcerative bacillary dysentery The cultures obtained from them contained a large number of paracolon and proteus organisms which produced colorless colonies on shigella salmonella (SS) agar These factors all increased the difficulty of bacteriologic diagnosis but simultaneously provided an unusually valuable series for the study of the relative efficacy of culture procedures

Patients were admitted to the hospital in the late afternoon. The diagnostic cultures routinely were obtained on the following morning The men in groups of 5 were given freshly sterilized pans Fecal specimens were collected and were carried at once to the diagnostic laboratory Here with little or no delay, an SS

(1) The studies reported were conducted in Korea by a Joint Dysentery Unit under the sponsorship of the Commission on Enteric Infections of the Armed Forces Epidemiological Board Those participating in the study in Korea came from the Army Medical Service Graduate School The Fleet Epidemic Disease Control Unit No 1 the Microbiological Institute and Communicable Disease Center of the U S Public Health Service the 406th (U S Army) Medical General Laboratory the 64th Field Hospital the Bureau of Laboratories of the Florida State Board of Health and Louisiana State University School of Medicine

(2) Director of Laboratories Florida State Board of Health

(3) Bacteriologist Bureau of Laboratories Florida State Board of Health

agar plate was inoculated Selected purulent exudate was used if present Within a few minutes to an hour a second culture was taken by rectal swab and inoculated at once on SS agar Immediately thereafter each patient was examined sigmoidoscopically and, during this, a swab specimen for bacteriologic examination was obtained from the area of maximum involvement. The 3 cultures were inoculated similarly using 1 plate of SS agar for each About half of the plate was streaked with the original swab and for better isolation the remainder was cross streaked with a fresh sterile swab The cultures had separate identifying numbers and in the laboratory each of the 3 from a given patient was handled as an individual specimen

During 3 months in 1951, a total of 3 128 patients were examined by the 3 methods described Shigellas were isolated from 1 or more of the specimens in 893 (28 5 percent) of these Of the cultures taken during sigmoidoscopic examination 608 were positive There was only a little difference in the results by the other 2 technics, the rectal swab yielding 509 positive cultures as compared with 496 from the passed specimens Of the 893 positive examinations 363 (40 6 percent) were found positive by 1 procedure only (95 by passed specimen only, 98 by rectal swab only and 170 by sigmoidoscopic swab only) Shigellas were isolated by 2 of the procedures from 307 patients (34 4 percent) and by all 3 in 223 (25 percent)

Heretofore the rectal swab technic has been recommended on the basis of practicability It may be stressed now that this simple procedure provides results equal to or better than those by a prompt culturing of freshly passed whole fecal specimens Considering the highly significant time factor it seems apparent that rectal swabs provide substantially more dependable findings in shigellosis than cultures on passed fecal specimens as they are ordinarily collected and submitted Cultures taken during sigmoidoscopic examination from the area of maximum involvement in the lower bowel yielded about 6 positives for each 5 found by either of the other technics

Examination by rectal swab has an advantage not indicated by these comparative studies It is a simple rapid method of obtaining cultures and the test may be repeated without hesitation On the basis of convenience and reliability, it is a method which may be used without hesitation

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EDITOR S NOTE Th p c d r d w ll be d bed d t il i Ha dy \ V M o R P Hame i k D and M t h ll R E B t l g c d g s of te ic f t o To b p bl h d th J r l

ACUTE LYMPHOCYTIC LEUKEMIA TREATED WITH ACTH

RALPH D ROSS *Commander MC USN (1)*

GREAT interest has been aroused in the treatment of acute leukemia since ACTH and cortisone have become available Donald and Higgins (2) reported that large doses of ACTH or cortisone showed a suppressing influence on the neoplastic lymphoid tissue of rats which had received an intraperitoneal inoculation with leukemic cells These hormones did not prevent the development of the leukemia, but appeared to ameliorate the condition and to prolong the survival time slightly Dobriner et al (3) observed that alterations in adrenal cortical function occurred in patients with lymphoid neoplasms Dougherty and White (4) observed that increased adrenal cortical function in animals resulted in an involution of normal lymphoid tissues Because of these and other observations, it was suggested that stimulation of the adrenal cortical function with ACTH might favorably influence the course of acute leukemia in man This form of therapy has been used by numerous groups of workers (5–18), with varying degrees of success Temporary clinical or hematologic remissions were observed in many of the reported

(1) U S N val Ho pit l Oakland Calif

(2) Do ald, T C Jr and Higg ns G M. Effect of high l vel of certa n ster ids on induced lymphocyt c l uk mia n r t Ca c r R s 11 937-942 Dec. 1951

(3) Dobriner K. L eberman S. nd Rhoad C. P Exer t n n uri e of metabol t s f adr nal co tical hormon s n h alth and di s including neopla t c growth Ca cer Res 7 711 May 1947

(4) Dougherty T F and Wh t A Effect of pituitary adr notrop c h rmon n lymph d tis ue Proc Soc Exper Biol & M d. 53 132 133 Jun 1943

(5) Schulman L Treatm t of l ukem with ACTH nd corti on Am. J D Ch ld. 80 521 522 Sept 1950

(6) Pe rs O H. and El l L P U f p tuitary ad nocortic tr pic hormon (ACTH) nd c rt son in lymphoma and leukemia J A. M. A. 144 1349-1353 De 16 1950

(7) Kin ll L W R g rs H. Bak C. nd J nkins B J M nocyt c leuk mia treated w th pituitary adreno t tr pic h m (ACTH) J A. M A 144 617-618 Oct 21 1950

(8) Moody L A. a d Dav R. W Dur t n f acut l uk mi n ch ldren view of l ter ur a d epo t f ca of unu ually long urv val Am. J Di Child. 80 955-962 D 1950

(9) Cam D o Town d, S. R M lls E. S. and Mathews W H ACTH a d o t s a n treatm nt of cut l uk mia Canad M A J 65 552 555 Dec 1951

(10) Dar J M. M So ll g C. E. La ki B J ckso S. H and Do oh e W L. ACTH and uso in treatmen f l uk m a i children. Canad. M A. J 65 560-564 De 1951

patients Temporary remissions occurred in about 50 percent of a group of children with acute leukemia treated with ACTH *(10)* None of the patients in that group however, could be considered to be cured or permanently benefited although repeated remissions were obtained in a few of these patients All eventually became refractory to further hormone therapy The treatment of acute leukemia with ACTH has been found somewhat more efficacious in children than in adults in the reported series

Four patients with acute lymphocytic leukemia have been given ACTH at this hospital since June 1951 All had died by 21 November 1952 The purpose of reporting this small group of patients with acute lymphocytic leukemia treated with ACTH is to point out some of the hematologic changes seen, as well as to call attention to the discouraging results obtained in this form of therapy

Method This group of patients was given ACTH intravenously The method used was essentially that described by Renold et al *(19)* The drug was given in 1 liter of 5 percent dextrose solution over an 8 hour period each day The dose was 20 or 25 mg per day at the beginning of therapy This was decreased to 5 mg daily in patients 1 2, and 3 over a period of time Patient 4 received 25 mg daily during the entire course of therapy Patient 1 developed a clinical relapse shortly after the ACTH was discontinued and 20 mg daily was given throughout the remainder

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(11) F be S. Dow g V Schw hm H T h R. Appl t R H ld, F Ki g J P d F t D. A t on f ACTH d rt l k m In Mo J R (d t) P oc d g f th Se d Cl l ACTH Co f n V l 2— Th p ut Th Bl k n C Ph l d lph P 1951 pp 251 288

(12) F be S Shw hm H T h R. Dow g V K dy B H d Hyd J Elf t f ACTH t l uk m childb d. I M J R (d) P d gs f th F Cl cal ACTH C f Th Bl k Co Ph l d lphia P 1950 pp 328 330

(13) S k y J M. H k, F J d W tki C H Co tis d ACTH manage- m f l k mi d lymph bla m P Staff Me May Cl 25 488 489 A s 16 1950

(14) Th n, G W F h m P H F wley T F H ll S. R. J R ch M St h l D d W l D L M dical pr g lini l us ful f ACTH d co tr *N w E gla d J M d. 242 824 834. May 25 1950*

(15) S und R. H J d Adams E Cha g cul g l ukocy foll w g dm ni tr f dr l rt tr (ACE) nd d rt t p h mo (ACTH) fect mo ucl d hr ni lymph l uk mia Blood 5 732 741 A g 1950

(16) P ll s, E. M K Bur h nal J H El l L P nd Pea O H R tan t tr p rt s d f l d tag ni l k m J A d A 148 987-994 M 22 1952

(17) P o O H El l L P d T lbot, T H J U f ACTH d ort so pl di a B ll N w Y k A d M d. 26 235 239 Ap 1950

(18) Sp T D Sto R. E. L p G G M l F T a R L nd R bo do A. R po t d no rt tr p horm d tu per w th ma l ka m d lymph ma La 2 241 244 A g 12 1950

(19) R ld, A E F ham P H Ma er J d Thor G W In ra ou ly dm ni t d ACTH p l mina y port N w E gl d J M d 244 796 798 May 24 1951

of his therapy This group of patients received, in addition to the ACTH, whole blood transfusions, antibiotics, and symptomatic and supportive measures as indicated No folic acid antagonists were administered to this group of patients

Clinical material This group of patients included 1 woman and 3 men whose ages varied from 16 to 28 years Bone marrow specimens revealed typical features of acute lymphocytic leukemia in all cases, as did the original peripheral blood smears Anemia was present in all of these patients on admission to the hospital

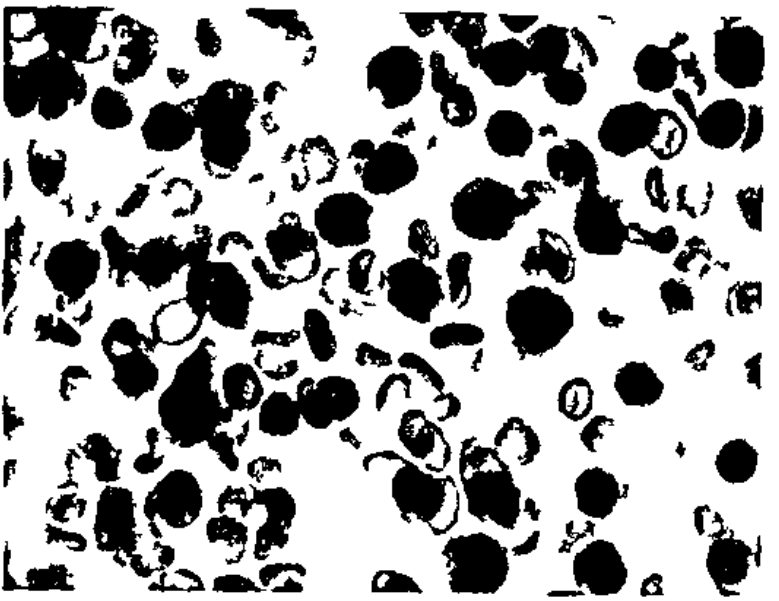
CASE REPORTS

Case 1 A 28 year-old man was admitted to the hospital on 10 June 1951 He had enjoyed good health until about 2 months prior to admission when he noted a "loss of vitality," moderate muscular weakness, loss of appetite, low back pain, pain and tenderness over his ribs, and moderate discomfort in his knees About 1 month prior to admission he noted that his gums bled on slight trauma At that time he was examined and treated by a dental officer and the gingival bleeding stopped after about 3 weeks He was told that he appeared pale during the month prior to admission and had had a frontal headache which had progressively increased in severity for 3 weeks before admission Ten days prior to admission he noted a blurring of vision in his left eye At that time he was found to have a rather marked anemia and was given 1 5 liters of whole blood, injections of liver extract, iron, and antibiotics For the 3 weeks prior to admission he had noted that he bruised more easily than previously and had also noted evidence of spontaneous bleeding into the skin without trauma.

On physical examination, he appeared moderately pale There were numerous ecchymoses in the skin of both forearms and buttocks A funduscopic examination revealed numerous retinal hemorrhages with a macular hemorrhage on the left (OS 20/400) There was tenderness over the distal end of his sternum and over his ribs The gingival margins were red, edematous, and boggy, but there was no evidence of bleeding There was no hepatomegaly or splenomegaly There were numerous firm nontender lymph nodes palpable in the cervical axillary, inguinal, and epitrochlear areas

A red blood cell count on admission was 3 1 million with 9 5 grams of hemoglobin and the hematocrit was 29 volumes per 100 cc A platelet count was 110,000 A leukocyte count was 20,000 with 4 percent neutrophils, 3 percent band forms, 1 percent monocytes, 2 percent eosinophils, and 90 percent lymphocytes of which 31 were blast forms A bone marrow specimen revealed

a hypercellular marrow of which 50 percent of the cells were reticulum cells and 50 percent were undifferentiated immature or stem cells of the lymphocytic series (fig 1) A bone marrow study on 10 July revealed 15 percent undifferentiated blast forms 22 percent lymphoblasts 48 percent prolymphocytes and 12 percent lymphocytes There was a marked increase in the elements of the lymphocytic series Elements of the myelocytic series were rarely seen A diagnosis of acute lymphocytic leukemia was made



Figur 1 Bon marrow b for ACTH therapy X 970

Therapy consisted of rest in bed repeated transfusions of whole blood ACTH, antibiotics and symptomatic and supportive measures Treatment with ACTH was started on 6 July This was given intravenously in 1 liter of 5 percent dextrose solution over an 8 hour period each day He was given 20 mg daily from 6 July to 8 August, then the dose was reduced to 5 mg daily This was continued from 11 to 19 August at which time this therapy was discontinued On 4 September treatment with 20 mg of ACTH daily was resumed and continued until his death on 19 October He received a total of 1,595 mg of ACTH

Prior to the ACTH therapy he developed a recurrence of the gingival bleeding abdominal discomfort and pain and tenderness over all bones By the fifth day of ACTH therapy there was marked subjective improvement which continued and became more marked as therapy was continued His abdominal pain and the osseous pain had cleared by the fifth day of therapy His appetite improved and by the tenth day all hemorrhagic manifestations had disappeared. After about 15 days of ACTH therapy the immature lymphocytic cells were no longer seen in the peripheral blood smears He continued to have anemia and he required frequent

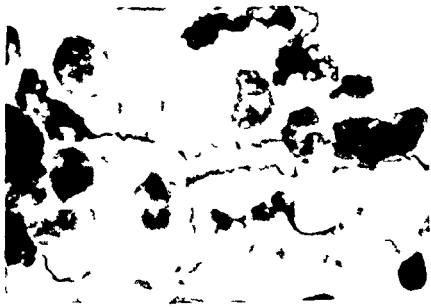
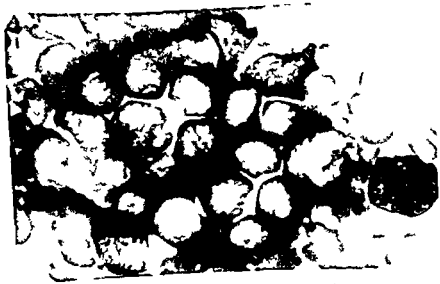


Figure 2. Bone marrow after ACTH therapy X 970

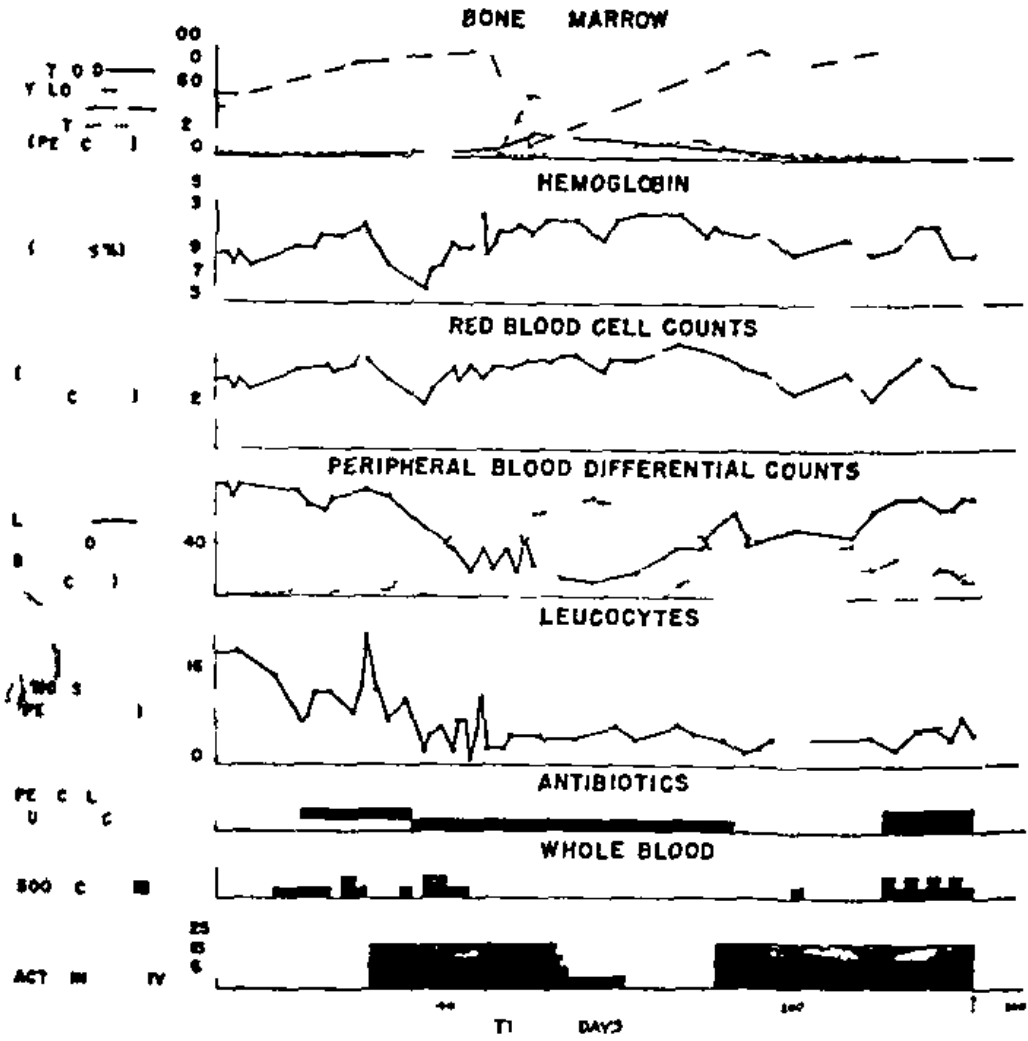
whole blood transfusions to maintain a relatively normal red blood cell count and hemoglobin determination After ACTH therapy, bone marrow studies revealed a marked increase in the myeloid elements, a mild increase in the erythroid elements, a marked decrease in the lymphocytic elements, and an almost complete disappearance of the immature forms (fig 2)

After the ACTH therapy was discontinued on 19 August he developed a temperature of 102 F , extreme nausea, vomiting, anorexia, generalized muscular weakness, myalgia, and osseous pain A bone marrow specimen on 4 September revealed a recurrence of the picture of acute lymphocytic leukemia with a predominance of blast and immature forms of the lymphocytic series



...ient soon to death X 970

(fig 3) ACTH therapy was resumed on 4 September His appetite improved but he continued to have myalgia, arthralgia, and osseous pain Radiographic examinations of all painful bones and joints were consistently negative By 1 October his muscular strength had decreased markedly and his hospital course from that time was progressively downhill On 18 October he became irrational, restless and he recognized none of his surroundings He had two convulsive seizures at that time and he then became comatose He died a few hours later (fig 4)



F g 4. H matologic find gs and treatm t i pat t i

Autopsy revealed petechial hemorrhages in the skin and mucosa leukemic infiltrations in the lymph nodes spleen liver bone marrow and dura mater subendocardial and subepicardial hemorrhages subperiosteal hemorrhages of the sternum and ribs hypertrophy of the adrenal glands (cortexes) and moderate hypertrophy of the pituitary gland

Case 2 An 18 year-old man was admitted to the sick list aboard ship on 29 July 1951 and was admitted to this hospital on 14 August. At the time of his admission to the sick list he complained of easy fatigability, weakness, lethargy, dizziness, malaise, abdominal distention, tarry stools, bloody urine, yellow discoloration of the skin and scleras, bleeding and soreness of the gums, and a weight loss of 20 lb He had enjoyed good health until May His fatigability, weakness, and lethargy had become progressively more severe His shipmates had informed him that he appeared pale

The physical examination at the time of his admission to this hospital revealed generalized weakness, moderate cachexia, a moderate icteric tinge to the skin and scleras, a moderate general ized lymphadenopathy, crusted lesions of the buccal mucosa and gums with a tendency to bleed, a marked pallor of the skin and mucosa, and numerous ecchymoses and petechias over the trunk and extremities The liver edge was palpable 6 cm below the right costal margin and was exquisitely tender The spleen was palpable 5 cm below the left costal margin

His leukocyte count was 3,050 with 80 percent lymphocytes, 17 percent neutrophils, and 3 percent blast forms His red blood cell count was 4 2 million, his hemoglobin was 12 5 grams, and his hematocrit was 35 volumes per 100 cc His platelet count was 47,000 His sedimentation rate was 52 A urinalysis revealed many red blood cells on microscopic examination A serum bili rubin test revealed 4 mg per 100 cc in 1 minute and 6 mg per 100 cc in 30 minutes A thymol turbidity test was 9 units His prothrombin level determination was 34 percent His coagulation time was 16 minutes and 45 seconds (Lee-White) His A/G ratio was 0 67 1 with a normal total protein determination His alpha globulin was 2 30 and his gamma globulin, 2 25 grams per 100 cc A bone marrow specimen taken prior to his arrival here revealed that the normal marrow elements were largely replaced by cells of the lymphocytic series in all phases of maturation, varying from blast forms to mature lymphocytes with a marked predominance of immature forms, and a diagnosis of aleukemic lymphatic leukemia had been made A sternal marrow specimen taken at this hospital on admission here confirmed the above impression

From the time of his admission to the sick list and prior to his admission to this hospital he had been given numerous whole blood transfusions in order to maintain a relatively normal red blood cell count and hematocrit level In this hospital he was given whole blood transfusions in amounts sufficient to maintain his hematocrit above 35 He was given 25 mg of ACTH intravenously every day for 22 days, after which the dose was gradually

decreased over a 14 day period and then this treatment was discontinued Following this course of ACTH the patient showed marked subjective improvement and a marked reduction in the hepatomegaly lymphadenopathy and hemorrhagic tendency About 1 week after the institution of this therapy his jaundice disappeared and his strength improved He developed a large abscess on the right leg which was incised and drained With antibiotic therapy there was gradual but progressive improvement. After the ACTH therapy was discontinued his symptoms recurred and he developed pain in all extremities and in the right upper abdominal quadrant. There was a recurrence of the hepatomegaly

On 10 October ACTH therapy with 25 mg daily was again started On this regimen the liver and spleen again regressed in size and by 7 November were not palpable By the middle of November he displayed marked weakness and his abdomen became markedly distended His liver and spleen enlarged rapidly at that time On 27 November the ACTH therapy was discontinued By 28 November he was rapidly losing ground He developed ecchymoses over the entire trunk and extremities He vomited frequently and bled from the gums and nose Frequent transfusions were administered During his period of hospitalization he received a total of 16 5 liters of whole blood On 3 December 1951 his leukocyte count suddenly rose to 56 000 with 98 percent lymphocytes including numerous immature forms At that time his liver was exquisitely tender and was palpable 3 cm below level of the umbilicus and his spleen was enlarged to the l of the umbilicus On 7 December his leukocyte count was 00 with 100 percent lymphocytes There was evidence of a derate anemia. He required large doses of opiates On 8 December he developed fever and a moderate cyanosis On 9 December he became dyspneic and cyanotic and died (fig 5) No autopsy was performed

Case 3 A 23 year old woman was admitted to this hospit on 2 August 1951 complaining of easy fatigability of 1 mo duration and amenorrhea since 26 April She had enjoyed health prior to the onset which was accompanied by some naus and occasional vomiting which she attributed to her e pregnancy She had noted occasional nose bleeds and bleed of the gums on brushing the teeth during the preceding mon She believed that she bruised more easily than other p and had often noted black and blue spots on her thighs she sustained trauma

Physical examination on admission revealed a rather m pallor Her temperature was 99 2 F There was a small of bluish discoloration of the skin over the lateral aspe her left thigh A funduscopic examination revealed 2 small

of retinal hemorrhage on the left and 1 on the right. There were numerous small, shotty, nontender, cervical, axillary, and inguinal lymph nodes Her spleen was enlarged to 1 cm below the level of the umbilicus and was nontender A pelvic examination revealed a 3 month intrauterine pregnancy

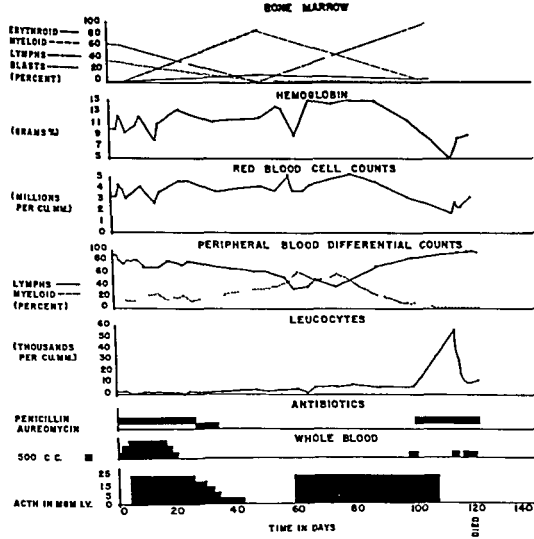


Figure 5 Hematologic findings and treatment in patient 2.

Her red blood cell count was 1,610,000 Her hemoglobin was 4 75 grams Her leukocyte count was 67,600 with 99 percent lymphocytes including many early blast forms A bone marrow specimen revealed a nearly complete replacement of the normal elements by cells of the lymphocytic series with many immature forms (fig 6)

She was given 20 mg of ACTH daily After 3 days of therapy her red blood cell count was 700,000 and after 5 days her leukocyte count dropped to 650, whereupon the ACTH therapy was discontinued for 8 days, during which time she was given a

total of 4 liters of whole blood She was also given antibiotics for an exudative tonsillitis Her leukocyte count increased to 5 400 with 37 percent segmented forms and ACTH therapy was reinstituted on 30 August Her sedimentation rate dropped from 42 to 2 Her spleen gradually decreased in size and by 15 September was not palpable Bone marrow specimens taken on 5 September and 1 October revealed findings suggestive of a chronic leukemia whereas prior to therapy the findings were



Figure 6 Bone marrow before ACTH therapy X 970

those of an acute lymphocytic leukemia There was a definite increase in the myelocytic elements in the bone marrow and a normal number of megakaryocytes appeared after she had been ACTH therapy She developed a moderate facial acne which sted throughout treatment

After a few weeks of ACTH therapy her hematologic findings remained stationary and normal until 25 December 1951 when she developed a temperature of 102 F a suboccipital headache mild to moderate abdominal cramps, and chills These symptoms persisted throughout the night and at 0800 on 26 December she delivered a macerated fetus of about 5½ months gestation Ten minutes later the placenta was delivered intact and there was a blood loss of about 50 ml Her postpartum course was uneventful and she became afebrile within 48 hours She was given a total of 1 080 mg of ACTH during the course of therapy The daily dose of ACTH was reduced to 5 mg on which regimen she remained until she was discharged from the hospital on 19 January 1952

She was followed as an outpatient and on 30 April a bone marrow specimen was normal (fig 7) On 1 June there had been no recurrence of splenomegaly, hepatomegaly or adenopathy (fig 8)

She remained in a clinical and hematologic remission until August when she was found to have a hematologic recurrence of the acute lymphocytic leukemia. The bone marrow specimen revealed that nearly all of the bone marrow elements had been replaced by immature lymphocytic cells. Only occasional erythrocytic and myelocytic elements were seen. Megakaryocytes were rare in the bone marrow smears. The biopsy findings were essentially those seen at the time of her original admission 1 year earlier. Per



Figure 7. Bone marrow after ACTH therapy. X 970.

leukocyte count was 35,000 with a predominance of lymphocytes, 30 percent of which were immature forms. She was readmitted to the hospital on 4 August and given 20 mg. of ACTH in 1,000 cc. of 5 percent dextrose intravenously over an 8 hour period each day. The daily dose of ACTH was gradually reduced to 7 mg. On this regimen of therapy she remained afebrile and asymptomatic. Her leukocyte count returned to normal, but there continued to be a predominance of lymphocytes.

A bone marrow specimen taken on 15 September revealed a hypercellular marrow and about 80 percent of the nucleated cells were of the lymphocytic series of which 20 percent were immature forms. Erythroid and granulocytic elements were present in all stages of development although they were diminished in quantity. Megakaryocytes were seen in the bone marrow smears but less frequently than normal. This patient was given 100 mg. of cortisone daily by mouth and the ACTH was discontinued. On this regimen she remained asymptomatic and her hematologic findings remained essentially unchanged until 17 November when she developed a sore throat, muscular weakness, chills, fever, and loss of appetite.

Examination at that time revealed a moderate pallor, a temperature of 103 F and a pulse rate of 110 There was increased generalized lymphadenopathy The liver was enlarged 2 5 cm below the right costal margin and was not tender The spleen was enlarged 5 cm below the left costal margin and was moderately tender There was evidence of an acute tonsillitis and acute pharyngitis The patient was moderately anemic Her leukocyte

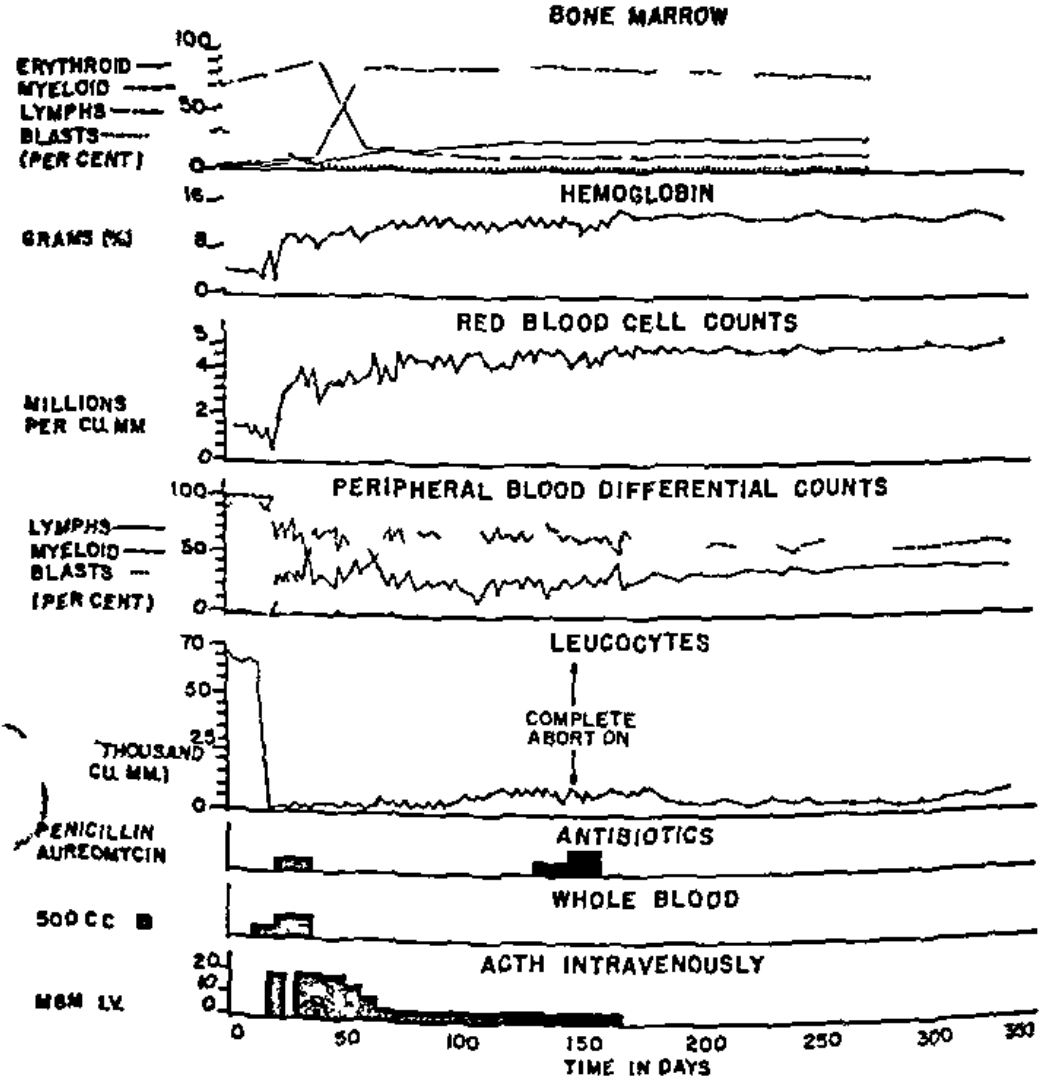


Fig re 8 Hematologic findings and treatm t i patient 3.

count was 2 900 with 95 percent lymphocytes most of which immature forms She was given massive doses of anti whole blood transfusions and cortisone and symptomatic supportive measures were used In spite of this she to run a febrile course She became comatose on 20 November developed a pulse rate of 180 She died on 21 November 478 after her original admission to this hospital

A postmortem examination revealed diffuse enlargement of cervical lymph nodes There was evidence of a recent

infarction in the lower lobe of the right lung There was extensive pulmonary edema The hilar lymph nodes were enlarged bilaterally The liver was enlarged, weighed 2,650 grams, and contained numerous leukemic infiltrations throughout its substance The spleen weighed 604 grams There was evidence of adrenal cortical hypertrophy A small active duodenal ulcer was noted There was mild hyperemia of the brain but no evidence of hemorrhage Leukemic infiltrations involved several organ systems

Case 4 A 21-year old man was admitted to this hospital on 6 September 1951 He had enjoyed good health until about 2 weeks prior to admission, at which time he developed a severe sore throat, muscular weakness, and general malaise He was given penicillin intramuscularly and symptomatic treatment. His symptoms completely disappeared He felt well after recovery from that illness until 24 hours before admission, when he suddenly developed a severe persistent cramping lower abdominal pain, chills, fever (104° F), general malaise, and muscular weakness He had lost about 10 lb in the 2 months prior to admission He had noted pallor of the skin and mucosa and a questionable yellowish tinge to the scleras and skin in the 3 weeks prior to admission

On admission his temperature was 100 2° F His skin was pale and slightly icteric There were numerous discrete, nontender, pea sized lymph nodes There was moderate lower abdominal tenderness on deep palpation without signs of peritoneal irritation The spleen was palpable 2 cm below the left costal margin and was mildly tender

His leukocyte count was 6,600 with 92 percent lymphocytes (mostly immature forms) The red blood cell count was 1 5 million and the hemoglobin was 5 A bone marrow specimen taken on admission revealed 18 percent blast forms, 59 percent early prolymphoblasts, and 16 percent lymphocytes which were very large and immature Very few platelets were seen The findings were consistent with a diagnosis of acute lymphocytic leukemia Leukocyte counts taken after his admission varied from 7,000 to 12,150 with cells of the lymphocytic series (mostly immature forms) predominating

He was given numerous whole blood transfusions and antibiotic therapy which resulted in mild subjective improvement On 8 September treatment with 25 mg of ACTH daily was started This was continued until 13 February 1952, during which time he received a total of 3 85 grams of ACTH After 7 days of ACTH therapy his symptoms had greatly improved and he was able to be up and around After 2 weeks of ACTH therapy his spleen was no longer palpable and his body weight had returned

normal After 3 weeks of treatment he developed a mild facial acne, some mooning of the facies, and a mild euphoria After 1 month of therapy he developed moderate bleeding from his left ear small ecchymotic areas in the skin and small petechias in the mucosa A sternal bone marrow specimen on 4 October revealed a predominance of immature lymphocytes but there was evidence of substantial myelogenous regeneration A subsequent bone marrow specimen was relatively normal, most of the cells being of the granulocytic series

On 14 October he developed an acute tonsillitis which responded well to antibiotics and symptomatic treatment He subsequently developed abscesses over the temporal area and both buttocks and thighs which required drainage By 31 October he began to note a recurrence of muscular weakness and fatigability At that time he developed pain cramping, and spasm of the calf muscles This was followed by generalized muscular aching and cramping which continued throughout the remainder of his period of hospitalization He remained ambulatory during this period in spite of his symptoms By 1 January 1952 he developed periods of rather marked depression and on several occasions he threatened suicide He had hallucinations and paranoid ideas There were occasional remissions of mental symptoms His body weight decreased appreciably A bone marrow specimen on 7 February revealed that nearly all of the marrow elements were of the granulocytic series and the vast majority of the cells were at the myelocytic and promyelocytic stage A few of the cells showed maturation as far as stab forms There was oplasia of the erythroid elements Only rare lymphoc, nts were noted and those seen were mostly mature megakaryocytes were seen The bone marrow findings at me were not those of a lymphocytic leukemia, but of an myelocytic hyperplasia and erythrocytic hypoplasia

On 7 February he began having recurrent episodes of epistaxis which were controlled with difficulty and he was g repeated whole blood transfusions as well as nasal packs course was progressively downhill and the ACTH therapy discontinued on 13 February After ACTH therapy was the leukocyte counts ranged from 1,850 to 12 700 and a definite decrease in the number of immature lymphocytes a tendency toward a more normal differential count On 21 F periods of coma and delirium appeared and his temperature to 105 F He later developed marked hallucinations, then into a deep coma and died on 25 February (fig 9)

Autopsy revealed numerous petechial hemorrhages in the and nasal, gastric and urinary vesicular mucosa There

moderate hypertrophy of the adrenal glands (cortexes) The pituitary gland was pale and firm There was generalized edema, a bilateral patchy pneumonitis, fatty metamorphosis of the liver, and an abscess on the right thigh

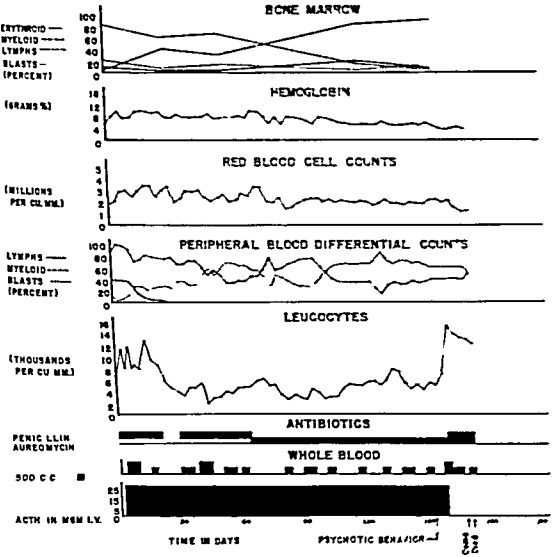


Figure 9 Hematologic findings and treatment in patient 4

DISCUSSION

The average duration of life in adult patients with untreated acute leukemia is usually less than 2 months Few live as long as 6 months *(9)* On rare occasions temporary, spontaneous remissions have been observed.

In addition to ACTH, the patients here reported were given whole blood, antibiotics, and symptomatic and supportive treatment. Folic acid antagonists were not used. Because of the combined form of therapy used in this group, it is difficult ac-

curately to evaluate the effectiveness of ACTH in the treatment of acute lymphocytic leukemia The period from admission to the hospital until death was 4 months and 9 days 4 months and 10 days 5 months and 19 days, and 1 year 3 months, and 19 days in the patients here reported A normal number of megakaryocytes reappeared in the bone marrow of patient 3 after ACTH therapy This was not observed in the other 3 patients in this group There was moderate improvement of signs and symptoms in all 4 patients for varying periods of time on ACTH therapy Temporary hematologic remissions were observed in the course of therapy All patients displayed evidence of refractoriness to the hormone therapy The psychotic behavior which developed terminally in one patient was not definitely attributed to the hormone therapy

ACTH will not bring about a permanent cure of acute lymphocytic leukemia but is a valuable adjunct to our present armamentarium for the treatment of this disease

BOOK REVIEW

1952 Y Book of Ob tetr cs nd Gy ol gy (J ly 1951 J 1952) d d *by J P G h ll B S M D F A C S Prof o f Gy ology* C k Cou ty Graduate S h ol f M d Att ding Gy log t Co k Co ty H p tal Att d ng Ob t t d Gy ol g t M h el R H p t l A iat Staff Ch cago Ly g- H p l A th r f Off Gy logy Ob tr c i G ral Pract d P c pl d Pra u of Obs trics 575 p g ill strated Th Y r Book P b- l he I Ch cag Ill 1952 P $5 50

This book adheres to the plan of organization used in previous years being about equally divided between obstetrics and gynecology The two main divisions are subdivided to cover all of the phases of both fields with the possible exception of female urology It provides an excellent guide and coverage of the outstanding articles of the world literature well abstracted with the main thesis of each article well and clearly stated enabling the reader to obtain a good grasp of the trends of practice thinking and research from the major clinics and schools of the Western World at least and even an occasional flash from behind the various curtains To the military medical officer particularly interested in the field it is a handy reference providing good coverage of a volume of literature more extensive than he could possibly hope to read for himself Dr Greenhill s editorial comments are timely and usually tolerant but with sufficient disagreement to be stimulating —*Lt Comdr J A Pease MC USN*

ACUTE TORSION OF THE GALLBLADDER[1]

LAWRENCE L BEA I *Captain MC, USN*

DAVID A SYMO D *Lieutenant junior grade MC, [illegible]*

WE have observed a new case of acute torsion of the gallbladder occurring in a 21 year-old man The youngest male patient with this condition heretofore reported was 38 years old (2) Recht (2) collected a total of 9[illegible] cases and added one of his own in a double gallbladder Cases not included in his collection have been reported (2, 4, 6) bringing the total up to 100

Anatomically, one of two rare variants must obtain in order that gallbladder torsion may occur Either the organ must be completely peritonealized, i e , hanging free in the abdominal cavity from a stalk containing its cystic duct and vessels, or its fundus must be completely peritonealized with the proximal body of the gallbladder affixed, along its length, to the liver bed by mesentery In the latter case, axial rotation may effect the acute torsion About 90 percent of the cases reported have occurred in healthy, thin, splanchnoptotic women usually in the 60- to 80-year age group The first reported case of torsion occurred in a 23 year old woman (6) One case has been reported in an 11 year old girl This preponderant occurrence in women has not been adequately explained The loss of supportive visceral fat, as well as the loss of tissue elasticity in elderly patients, has been assumed to be responsible for the occurrence of the onset late in life in most cases

In attempting to evolve a typical syndrome to aid in preoperative diagnosis, most authors admit failure The early nontoxic appearance of a patient with marked definite localized pain and

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(1) U S Naval H pital Great Lakes Ill

(2) Ca e T C Acut torsio of gallbladder Am J Surg 82 749-753 Dec 1951

(3) R ht W Tors on f d uble gallbladder report of case nd review f l terature Br t J Surg 39 342 344 Jan 1952

(4) P k M E and F han J J J A ut torsion of gallbladder Surg 27 423 426 Mar 1950

(5) Vynal k W J nd P l ucek F P Tors on f gallbladder Ill i M J 99 268-269 May 1951

(6) W nd l A V Ca of floating gallbladd and kidn y compl cat d by chol l thi si with perfor t f gallbladder Am Surg 27 199 1898.

tenderness should arouse suspicion of acute torsion of the gall bladder *(2)* The presence of boardlike rigidity and exquisite tenderness of the epigastrium concomitant with a soft nontender hypogastrium was the most striking finding in the patient herein reported Most of the preoperative diagnoses in the past have been either of perforated duodenal ulcer or of acute appendicitis Fortunately both diagnoses have led to early surgical intervention which is of lifesaving importance in this condition

CASE REPORT

A 21 year old man had been in excellent health until 3 hours before entry at which time he noted a gradual but fairly abrupt onset of cramplike epigastric pain At the time of the onset he was riding on a bus having eaten a light meal about 45 minutes previously His pain persisted for about 10 minutes subsided for a few minutes, and then abruptly returned Soon, however, the pain became steady nonradiating and very severe, causing the patient to double up It persisted and was present at the time of admission There had been no nausea vomiting chills, abnormal stools anorexia or urinary complaints There was no history of previous similar episodes preprandial epigastric distress, jaundice recent food or drink excess food intolerance or trauma

On admission the patient s temperature was 97 F and his pulse was 60 His epigastrium was boardlike and exquisitely tender but his hypogastrium was soft and nontender Just above his right costal margin when he was sitting upright percussion gave a hyperresonant note He had no tenderness in the costovertebral angle Roentgenograms taken in the supine, upright and t lateral decubitus positions revealed no free air in the peri al cavity but a moderate amount of air was present within duodenal loop

About 5 hours after the onset the patient was taken to surgery with a tentative diagnosis of perforated duodenal ulcer On opening the abdomen through a right rectus incision a large dark gangrenous gallbladder was seen It was long and thin with hardly any attachment to the liver It had twisted completely on itself in a counterclockwise fashion causing the apparent strangulation and infarction of the entire gallbladder wall The cystic duct and artery were separately ligated and the gall bladder removed A drain was placed down to the cystic stump through a stab wound in the flank and the abdomen closed The gallbladder contained thick bile but no stones The mucosa appeared gangrenous

The pathologist reported the gallbladder to be almost completely covered with peritoneum and to measure 7 by 3 cm The wall was thickened and extensively hemorrhagic Microscopically

there was irregular autolysis of the mucosa and some hypertrophy of the muscle Throughout the sections there was extensive hemorrhage and vascular distention The cystic artery was not thrombosed The final diagnosis was venous infarction of the gall bladder The patient made a rapid and uneventful recovery

BOOK REVIEWS

The National Health Service in Great Britain An Historical and Descriptive Study by *James Stirling Ross* 398 pages illustrated Oxford University Press New York N Y publishers 1952 Price $7

The social betterment of a nation and its relation to the medical practitioners is an important issue today in the United States In order better to understand the issues of "socialized medicine" many fine articles have been written by lay and professional writers, but few physicians read the lay reports or hear any but our own version of Great Britain's National Health Service This book presents the background and reasons that the Britains and Scots accepted, even demanded, better health services The deep chasms separating the poor from the upper and middle classes in the Victorian era later brought demands for drastic social improvement The acceptance of these reforms as an economic necessity soon made it apparent that health as well as education, social security, and productivity were equally vital to the national well being of Britain

From the early public health concepts of the late nineteenth century to World War II there was a gradual realization that clinical medicine should somehow become a universally available service With the selective service statistics and dislocation of urban dwellers to the country due to bombings of World War II, the deplorable state of health became apparent to all Even during Britain's darkest hours, parliamentary debates on the National Health Service were taking place This written report of the organization, operations results, and, particularly, the problems of the National Health Service are chronologically and clearly presented The operation of the plan from 1948 to 1952 is clearly and forcefully presented Most of the volume is directed to the medical service in hospitals and general medical practice, but there are chapters on dental, nursing, pharmaceutic, and the administrative functions, both voluntary and governmental The National Health Service in Scotland is also discussed Finally the future policy and very frank discussions of costs and budgets

form a comparative measure of the price a nation must be prepared to pay for a national health service

In consideration of any social reforms affecting medical practice in the United States this material is invaluable It needs the supplement of sufficient professional opinions on what the physician dentist pharmacist and others have determined about the advantages and particularly the disadvantages of socialized medicine as practiced under the British system Certain opinions from this country are discussed in Mr Ross book but it is important for all our medical men to be fully informed on the causes direction, and future of this radical change in the traditional doctor patient relationship

—Col G L Orth MC USA

Psychology of Physical Illness Psychiatry Applied to Medicine Surgery and the Specialties Edited by *Leopold Bellak* M D Clinical Assistant Professor of Psychiatry New York Medical College Flower and Fifth Ave Hospital New York N Y 243 pages Grune & Stratton Inc New York N Y published 1952 Price $5 50

The 15 chapters of this book are so organized as to present the psychologic implications of the most common medical and surgical diseases Furthermore the psychogenic aspects of somatic complaints are discussed for convenience of organization and because psychosomatic and somatopsychic problems often interact The introduction briefly and clearly summarizes the modern approach to medicine which views the person as an entity and does not separate the body s response to trauma infection and general stress from its reaction to psychogenic stimuli

Each chapter is written by a different clinician The chapters include psychiatric considerations as applied to general practice internal medicine problems of malignancy general surgery plastic surgery gynecology and obstetrics diseases of the genitourinary system rehabilitation and orthopedics diseases of ear and nose and throat neurologic disease pediatrics dermatology and dentistry as well as an enlightening final chapter on the personality of the physician as a liability or an asset The type of material found in this book should be added to the purely organic discussions of disease usually found in standard textbooks of medicine and surgery

Because of its broad applicability to all branches of medicine and surgery this book should be read thoroughly by all practitioners of medicine regardless of specialty as it condenses in a small volume the psychiatric implications of the major organic diseases The book is beautifully bound in water-repellent cloth

—Col F R Drake MC USA

EVALUATION OF THE PHYSICAL FITNESS OF PRESENT-DAY INDUCTEES

BERNARD D KARPINOS *Ph D (1)*

EARLY in 1944, the U S Army adopted a profiling system to evaluate the physical capacities of men entering the military service In its broad aspect, the profile system was designed to serve as an additional means for properly allocating and using manpower within the Army The need for definite criteria which could serve as a basis for an effective assessment of a person's qualities in relation to his prospective job assignments in the military service had been fully recognized by the Army since the beginning of World War II It had, however, been believed that a person s occupational specialty alone was sufficient to accomplish the desired optimum use of manpower A person's occupational skill and intelligence level were therefore the sole criteria for job assignment, and until 1944 there was no system within the Army to classify a person's physical capacities This led eventually to a critical qualitative maldistribution of men among the various components of the Armed Forces, by which the Army Ground Forces were most unfavorably affected

During World War II the United States Armed Forces consisted of 2 major departments the Navy (including the Marine Corps and Coast Guard) and the Army (including Ground Force, Air Force (2), and Service Forces) A keen rivalry for manpower prevailed during World War II between the Army and the Navy, and simultaneously among the 3 major commands within the Army

The Army and the Navy competed for manpower through voluntary enlistments Until the end of 1942, men liable for induction under the Selective Service Act of 1940 were allowed to volunteer for enlistment in the service of their liking Both the Army and the Navy conducted extensive recruiting campaigns to secure volunteers As an inducement, the Army offered to its volunteers a choice of assignment within the Army Most of the volunteers chose the more appealing" Air Force Thus, the Ground Force

(1) Medical Statistical Division Surgeon General's Office Department of the Army
(2) The Air Force became an independent department in September 1947

and the Service Forces had to depend primarily on men inducted through the Selective Service System The physical and mental standards for enlistment especially those of the Navy and of the Air Force, were higher than the general requirements for induction The result was that the Navy and the Air Force were able to obtain men of better caliber, from a physical and mental viewpoint *(3)*

If the Ground Force fared poorly in the competition for enlistments they fared no better in their competition with the Service Forces for the qualitative allocation of inductees Because occupational skill was the primary determining factor in job assignment men who came into the Army with any sort of previous occupational training tended to be assigned to the Service Forces and the Ground Force obtained what was left. It thus developed that men of high physical stamina were assigned to noncombatant jobs where a high degree of physical fitness was not the primary need and the Ground Force needing men for combat duty, were receiving proportionally more men who were physically and mentally inferior Furthermore, all Army personnel were eligible to apply for Aviation Cadet Training or for the Army Specialized Training Program This further depleted from a qualitative standpoint the ranks of the Ground Force

The inadequacy of this type of distribution soon revealed itself and the situation became critical in 1943 when the casualty figures rose sharply and there was a desperate need for physically fit replacements The Ground Force began to complain more and more vigorously about the type of men they were being nished for training It then became obvious that certain means d to be devised for the distribution of manpower which would nsider a person s physical capacities as had already been done with respect to occupational skills and intelligence level The Surgeon General of the Army was requested, therefore in the fall of 1943 to formulate a plan for a physical classification to be used in the assignment and distribution of personnel *(4 5)*

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(3) V lmntary lis me in he Armed For of me betw 18 nd 38 y f ge wa opped De mbe 1942 (WD Cir ula N 397 1942) Beginning w th 1 F bruary 1943 both he Army nd he N y had procur ll listed pe onnel w him be ge thr ugh the pe t on f the Sele S rvic Sys m (SPX 324 71 (1 22-43) PR I, 22 J 43). Me 17 yea ld how inued t be nlist d by h Navy Al the Army bega lis 17 y ld int the E list d R rv Corp nd Air Corps Enlisted Re rv Th rvists w lig bl for t duty th Ar y until hey ea h d 18 ye f g Thus this ha g p licy w ly partially ff t ve in it tt mpt t p luntary l me

(4) Phys cal Standa d R h Pr je t p pa ed f th Adj ta t General Offic P nnel Research nd P oc dur Branch Ma pow Analy is Se on 4 Aug 1949

(5) Hi ory of he Physical Pr f le Se ial System I tra-off memorandum Physical Standard D is n Surge General Offic 10 Jun 1945

It was clear from the nature of the request that a system had to be devised which would provide a concise descriptive evaluation of a person's physical capacities from a functional, rather than a diagnostic, point of view and that this evaluation had to be couched in terms readily understandable by nonmedical men in charge of assigning recruits After many proposals for such a plan, the PULHEMS system (*6-10*), which was developed by the Canadian Army for the same purpose, was adopted in essence by the United States Army

PULHES SYSTEM

The United States profile system is known as PULHES As defined by the Army Regulations on physical standards and physical profiling, the separate factors comprising PULHES express the following

P—Physical capacity or stamina Organic defects, age, build, strength, stamina, height, weight, agility, energy, muscular co-ordination, and similar factors

U—Upper extremities Functional use of hands, arms, shoulder girdle, and spine (cervical, thoracic, and lumbar) to include strength, range of motion, and general efficiency

L—Lower extremities Functional use, strength, range of motion, and general efficiency of feet, legs, pelvic girdle, and lower back (sacral spine)

H—Hearing (including ear defects) The auditory acuity is to be considered as well as organic defects

E—Eyes Visual acuity, as well as organic ocular defects

S—Neuropsychiatric Emotional stability, personality, as well as psychiatric history and findings

Except for the P factor, the profile factors relate either to the functional capacity of specific organs, or to a specific evaluation, as the S factor The P factor, however, is both specific and general It is specific in that it refers to the functional capacity of all other parts of the body, not specified under the other factors, and it is general in that it is affected by the extent to which de

(6) Moo y C M. Pulh ms Canad Army J No 2 pp 13-19 Apr 1947
(7) Meakins J C. Pulh ms yst m of medical grading Canad M. A J 49- 349-354 Nov 1943
(8) Fl tcher R. T PULHEEMS a new syst m of med cal clas if cat on Brit M. J 1 83-88. J 15 1949
(9) Campbell A E Ass me t of physical fitne s f r s rv c in Br tish Army U S Armed Forces M. J 1 1527 1535 Dec 1950
(10) War Office (Unit d Kingd m)- R port of the He lth of th Army 1946-1948. W O Cod No 6765 J n 12 1952

fects of any organ, including disorders of a psychiatric nature are affecting a person s general functional ability

In evaluating a person s profile, each of the factors is graded on a numerical regressive scale from 1 to 4, according to the man s functional capacity in the particular factor Generally grade 1 represents functional efficiency above the average, with no physical defects or minimal physical defects grade 2 represents average functional efficiency, with mild nonprogressive physical defects grade 3 represents functional efficiency below the average with moderate physical defects (borderline) and grade 4 represents functional capacity below the existing minimum requirements for military service The grade profile factors are collectively referred to as profile serial

For a general evaluation and allocation of manpower the profile serials are grouped in 4 physical categories (A, B C and E) based on the grades of the various profile factors At present the physical categories are defined as follows *(11)*

A—A profile in which lowest rating is 1 (e g 111111)
B—A profile in which lowest rating is 2 (e g 112111)
C—A profile in which lowest rating is 3 (e g 211113)
E—A profile in which lowest rating is 4 (e g , 412112)

PULHES VS PULHEMS

Though basically the same as the Canadian system (PULHEMS) the United States profile system (PULHES) represents a fundamental departure from that system The primary difference between these two systems is the omission in PULHES" of the M factor oting intellectual (mental) status and derived from the M administered to all men processed for military service in nadian Army for the measurement of their general mental " These tests have a dual function in the Canadian system y are designed to gage the recruit s ability, under Army conditions to learn to perform successfully general duties under supervision" and screen out those who do not possess such *ability and to serve together with the other profile factors as a* basis for allocating men who pass the test to the proper arm or corps within the Army

The tests consist of a series of problems The raw scores obtained on these tests are usually expressed in terms of 6 groups presenting a gradation of mental ability from superior ability (group I) to "very little likelihood of success in normal basic training" (group VI) From these mental groupings the following profile grades of the M" profile factor are derived

(11) Physical Stand d nd Physi l Prof l g for E ls me nd Induc on AR 40-115 (Aug 1948).

1 Intelligence sufficient for full combat duty and training, including appropriate tradesman or specialist training

2 Intelligence sufficient for nontradesman or nonspecialist combat duties or for trades requiring experience rather than abil ity

3 No grade 3 is assigned to the "M" factor

4 Specific defect or defects, e g , slight mental retarda tion Useful only in works companies, pioneer companies, et cetera

5 Unsuitable for service anywhere in any capacity (*6, 12*)

The initial mental tests employed by the U S Army, currently known as the Armed Forces Qualification Tests (AFQT), corre spond to the "M" tests in general structure and initial function Structurally, the AFQT contain in equal proportion (1) questions on the meaning of words, (2) arithmetic problems, and (3) prob lems dealing with forms and patterns These tests are given to each examinee at the time of the initial examination The AFQT were first used in 1950 (*13*)

On the basis of their scores on the AFQT, the present day examinees are divided into 5 groups representing, as on the AGCT, a regressive range in mental ability from very rapid learn ers (group I) to very slow learners (group V) (*14, 16*) The groups expressed in term of scores on the AFQT were (until December 1951) as follows

Group	*Score*
I	93 100
II	65 92
III	31 64
IV	13 30
V	12 and below

These values for groups IV and V prevailed during the time of the findings here presented Since December 1951 the score range

(*12*) Physical Standards and Instructions for the Medical Examination of Service Soldiers and R cruit for th Canadian Army Active and Reserve 2d edition, 1 (Section III Fun ti nal Int pr tation of Medical Grades—Men; ectio VIII Pers Secti r)

(*13*) During the 1948 induction proc ssing th Army General Clas ification (AGCT) was us d for the me purpose It was also u e l during World War II, except that it was acc mplished t the r c pt on c nters and not at the time of the first exam nati n a has be n the pr ctice since 1948 AFQT and AGCT are essentia the same

(*14*) Enli ted Men Initial Cl ification AR 615-25 (31 July 1942)

(*15*) Per nnel Clas ification on TM 12-425 W r Department (17 June 1944)

(*16*) P r nnel Clas ification Tests TM 12 260 W r Department (Apr 1946)

for group IV has been 10 to 30 and that for group V, 9 and below *(17)*

Functionally the AFQT have been devised to measure the recruit s ability to absorb military training within reasonable limits of time " to eliminate those who do not have such ability (group V) and to provide a uniform measure of the general use fulness for the service" of those who qualified on the test (groups I IV) At present, the latter groupings serve as the basis for an equitable qualitative distribution of manpower among the various components of the Armed Forces (Army, Navy, Marine Corps, and Air Force)

With this initial mental assessment the function of the AFQT ends Each man inducted into the Army however is given at the reception center an additional series of tests known as the Army Classification Battery These tests have been developed to measure specific" kinds of aptitude, knowledge, or skill and thus determine the recruit s specific usefulness to the service in particular kinds of job or training assignment In addition to these tests the recruit s physical profile, accomplished at the induction station is verified at that time His military occupa tional specialty (MOS) and assignment are determined on the basis of the latter tests and the verified physical profile *(18 20)*

Unlike the M" tests however the results of the AFQT and those of the other mental tests do not constitute a part of the U S profiling system Only the mentally deficient who have been psychiatrically so determined are graded under PULHES As ovided by the existing regulations on the processing of ex ees determination of mental deficiency is part of the psychi examination It is accomplished independently of the AFQT e though these scores may bear invaluable corroborative vidence of the presence or absence of mental deficiency This examination aims essentially at innate mental deficiency or at acquired" mental deficiency which is not due to sheer lack of educational opportunities or unfavorable environmental condi tions *The AFQT are primarily a screening and general evaluation* device and they do not attempt to differentiate among the under lying causes of low mental ability Illiteracy per se consequently is not considered mental deficiency in the psychiatric sense nor is in general low educational attainment per se judged as such Mental deficiency psychiatrically defined is recorded in the PULHES system under the S factor

(17) General R i w f h Induc Exp nc Und th S l S rv e Ext nsion Act of 1950. He lth f the Army 1 6 N 11 pp 1 13 Sept 1951
(18) E list d Me Army Cla ific t Battery SR 615-25-27 (F b 1951).
(19) E list d Men. Cla ification Proc dur SR 615-25-25 (F b 1951).
(20) Enlisted P r onnel Proc dur for U f Rat T bl s in D tribut of E listed Pe onnel SR 615-25-28 (F b 1951).

Under the U S profiling system, each examinee is thus assigned at the time of initial examination a double classification to reflect separately his physical category, based on the medical (physical and psychiatric) examination, and his mental grouping, based on his AFQT score, e g , A III (physical category A and mental group III) Similar recording procedures are followed at the reception centers The profiling is confined to medical findings The mental scores are reported separately, including the recruit's aptitude area, derived on the basis of the tests given at the reception centers All these findings are recorded on the "Soldier's Qualification Card" (WD AGO Form 20) *(21 23)*

The separation of these two measures of appraisal—one relating to physical stamina and the other referring to intelligence and skill—is fully justified from a theoretical as well as from a practical point of view Theoretically, they represent two distinct levels of evaluation that should be kept apart From a practical point of view, this double classification is important in the assignment of men to the proper job within the Army because different jobs represent distinct balances between physical and mental requirements Furthermore, the physical standards have practically reached a stabilized level and no basic changes in these standards may be expected, but the intelligence requirements (as determined by AFQT and equivalent tests) are elastic to a great degree Because of this elasticity in the intelligence requirements, it is essential to be able to identify men who are physically qualified (physical categories B and C) but are intellectually marginal This can be expediently accomplished on the basis of such a classification In fact, this classification was used when the AFQT requirements were lowered in December 1951 and all those who were found medically qualified but who failed the test prior to that time were re examined *(24)*

ACCOMPLISHMENT OF PROFILING

The United States profiling system was inaugurated in 1944 *(25)* and was initially carried out at the reception centers At that time profiling had as its purpose the qualitative apportionment of the men among the Ground Force, Army Service Forces, and Air Force, after the critically needed specialists had been assigned

(21) Enlisted Personnel Joint Exam ing and Induction Statio Procedure SP 61-180-1 (N v 1951).

(22) Enlisted Personnel Armed Forces Exam ning Station SP 615-100-1 (Oct 1951).

(23) Pers onel Army Reception Center Personnel Processing Procedures AR 600-510-5 (Aug 1950).

(24) Re ults of Re-examinations of Selective Service Registrant H alth of the Army v 5, 7 No. 7 July 1952

(25) Adjutant General s Letter SPOX 220.01 (3 Mar 1944) OC-WDGAP and W r Department Memorandum Physical Profile Plan W40-44 (May 1944) and S p lement to MR 1-9 Physical Pr file Serial (May 1944).

A special study on profiles was carried out by the Surgeon General s Office at the training centers during the period from 16 December 1944 through April 1945 It was undertaken primarily in order to determine the reliability of the physical profiles accomplished at the reception centers and to obtain information on the physical status of men who had completed basic training No attempt has been made here to draw on that material for comparison with the present findings because the physical profile categories were derived then in a different way from that now used Furthermore, the physical standards have been changed since then especially with respect to psychiatric requirements

Beginning with the enactment of the 1948 Selective Service Act the profiling of each examinee and the assignment of a physical category is being accomplished at the time of the initial medical examination Since the end of 1951 the accomplishment of the medical and mental examination was transferred from the induction stations to the Armed Forces examining stations which are charged with performing these examinations for all Armed Forces of both registrants and enlistees who are within the chargeable group namely all who are not exempt from induction under the existing Selective Service Act *(26)* A special box is designated for this purpose on the examinee's Report of Medical Examination" (Standard Form 88) as follows

PHYSICAL PROFILE					
P	U	L	H	E	S
PHYSICAL CATEGORY					
A	B	C	E		

Under Physical Profile the examinee s respective grade for each factor is recorded under Physical Category the proper box is checked as determined by the profile grades In the case of Selective Service registrants the profiles are likewise reported on the examinee s Record of Induction" (DD Form 47) accomplished in addition to Standard Form 88 This form also carries the examinee s score on the mental test and his mental group This profiling is applied to both disqualified and qualified registrants

(26) SR 615-100-1

FACTORS AFFECTING PROFILES

Prior to discussing the findings with respect to the profiles of the present-day inductees, the primary changes in the current medical standards and the induction policies affecting these findings will be briefly considered

The medical standards which governed the acceptability of men for military service during the period, to which the present findings relate, are set forth in Army Regulations (27) The only deviation from these standards were the temporary, relatively high, dental requirements which were effective during the first 2½ months of this period The temporary stringency in the dental requirements was dictated by an early lack of sufficient dental personnel in the Army to handle the dental load that would have resulted from low dental standards The present dental requirements are the same as those of World War II, after 1942, which state that any well nourished person of good musculature is acceptable, if free from gross dental infections, and having a minimum of an edentulous upper jaw and/or edentulous lower jaw, corrected or correctible by full denture or dentures The present physical standards are virtually the same as those of World War II (after 1942), except for the psychiatric requirements which have been liberalized since World War II The change in policy with respect to psychiatric requirements stems from World War II experience which seemed to suggest that the psychiatric standards applied then for eliminating men with minor evidences of instability might have been overcautious and thus possibly have brought about a loss of potential military manpower (28) Under the present standards, psychoneurosis of any degree is acceptable if it has not incapacitated the person in civil life Persons with a history of transient psychotic reactions are considered acceptable if they have otherwise demonstrated stability Such persons were not acceptable during World War II There were also some minor changes towards lower physical standards with regard to perforated eardrums, paroxysmal convulsive disorders (if controlled by medication), moderate deformities of the extremities, et cetera, which were considered disqualifying defects during World War II

Of the changes in the general induction policies affecting the profiling of inductees, the most important is the change with respect to induction of persons formerly classified as "limited service" The term "limited service" is no longer in use In essence, however, men now classified as physical category C are of the limited service" type There was no constant policy during

(27) Phys cal Standards and Phy cal Prof ling for Enl tment nd Induct on AR 40-115 (20 Aug 1948)

(28) Brill N Q and Be be G W P ychon urosis mil tary ppl cati ns of f ll w p study U S Armed Forc s M J 3 15-33 F b 1952

World War II regarding the induction of limited Service personnel Such men were (1) not inducted (2) inducted on a quota basis (usually 5 percent) in relation to the other qualified registrants or (3) their induction was restricted by certain additional educational and occupational standards not required of other registrants At present there are no numerical or other restrictions with respect to the induction of persons in physical category C *(17)*

TABLE 1 *Percentage distribution of inductees by physical category and mental group (August 1950 through June 1951)*

Physical category	Mental group					
	I	II	III	IV	V	Total
A	4.2	12 1	17 9	28 1	13 3	75.6
B	1 5	3.3	4 2	5.4	1 9	16 3
C	0 8	1 8	2 1	2 5	0 9	8 1
Total	6 5	17.2	24 2	36.0	16 1	100 0

Data include nonmentally disqualified registrants Administratively deferred and postponed registrants not included

PHYSICOMENTAL DISTRIBUTION OF THE INDUCTEES

Though the object of this analysis is to present data on the physical evaluation of the inductees it seemed desirable for general orientation to present the mental grouping of the inductees along with their distribution by physical category This distribution of the registrants inducted during fiscal year 1951 (August 50 through June 1951) is given in table 1 *(29)* The data presented in the table are based on Summary of Registrant Examinations for Induction" (DA AGO Form 316) This report is prepared each month by each induction station and submitted to the Office of the Surgeon General The information for this summary report is obtained by the induction stations from the DD Form 47 and Standard Form 88

DISTRIBUTION OF PHYSICAL CATEGORIES B AND C

In a general evaluation of physical fitness a distribution by physical categories as shown in table 1 may be sufficient but more detailed information is needed when general plans for training or for job assignment are considered From the point of view of training or job assignment there is a difference between

(29) The induction of registrants under the Selective Service Extension Act of 1950 began in August 1950

TABLE 2 Distribution of inductees in present category 2 by PULHES
Total 19,332
(August 1951 through June 13[illegible]

Combination of factors	Number of persons having rating 2 under each factor						Percent of persons having rating 2 under each combination of factors
	P	U	L	H	E	S	
P	2,5[illegible]	-	-	-	-	-	1[illegible]
U		3 2	-	-	-	-	1.3
L	-	-	4,2[illegible]	-	-	-	21.1
H		-	-	[illegible]4	-	-	5.8
E	-	-	-	-	6,[illegible]5	-	34.5
S	-	-	-	-	-	1,5[illegible]	8
PU	16[illegible]	16[illegible]	-	-	-	-	.9
PL	662	-	662	-	-	-	3.4
PH	9	-	-	9	-		
PE	250		-	-	5[illegible]		2.5
PS	1,[illegible]8		-	-	-	1,[illegible]8	5.5
UL		8	8		-		
UH		16		16			1
UE		42	-		42		2
US		9	-	-		9	
LH			62	62			3
LE			41[illegible]		418		2 2
LS			125			12	.6
HE				60	60		
HS				12		12	1
ES					129	12[illegible]	7
PUL	19	19	19				1
PUH	4	4		4			
PUE	11	11			11		1
PUS	4	4				4	
PLH	14		14	14			1
PLE	67		67		67		3
PLS	33		33			33	2
PHE	1			1	1		
PHS	4			4		4	
PES	21				21	21	1
ULH		1	1	1			
ULE		2	2		2		

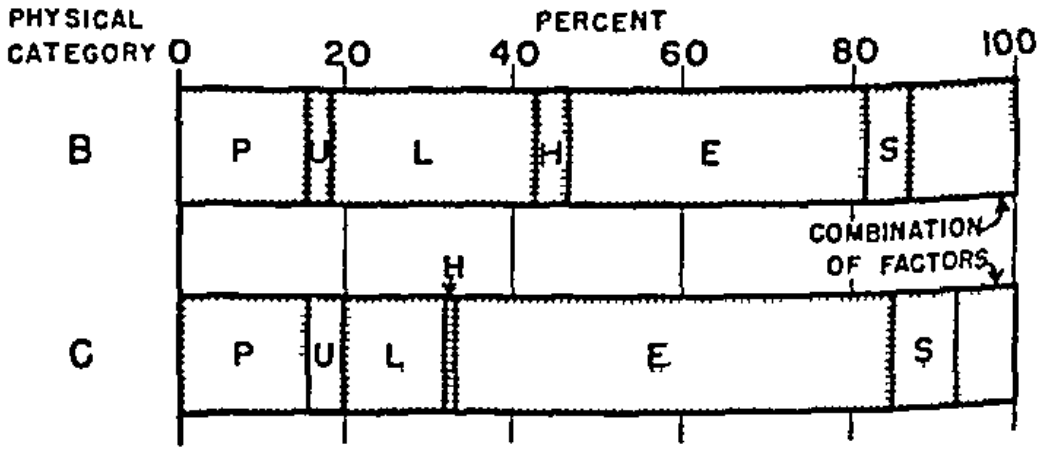
TABLE 2 *Distributio / nduct phys cal cat gory B, by PULHES Tot l 19 388—Conti d*

(August 1950 th gh J e 1951)

Comb nat on f fa to	Number f p s ns ha g r t g 2 und h fact						P t f pe as ha g ratu g 2 und h c mb nat on f f ct
	P	U	L	H	E	S	
ULS		3	3			3	
LHE			6	6	6		
LES			20		20	20	1
PLHE	1		1	1	1		
PLHS	2		2	2		2	
PLES	5		5		5	5	
PHES	2			2	2	2	
PULE	1	1	1		1		
ULES		1	1		1	1	
PLHES	1		1	1	1	1	
N mbe	4 593	884	6 228	980	7 958	1 606	
P	23 7	4 6	32 1	5 1	41 0	8 3	100 0

S mpl bul t f DD F m 47 d S ndard F m 88
Le th 05 p t

persons classified say as B, because of E," or "L or S actors or because of all profile factors combined It is important know the specific limiting profile factors In order to obtain uch information a sample tabulation was made of inductees in the physical categories B and C in terms of the profile factors The results for fiscal year 1951 are shown in tables 2 and 3



F gure 1 Dist ibution of inductee phy ical cat gori B and C by PULHES

TABLE 3 *Distribution of inductees in physical category C, by PULHES*
Total 9 761
(August 1950 through June 1951)

Combination of factors	Number of persons having rating 3 under each factor						Percent of persons having rating 3 under each combination of factors
	P	U	L	H	E	S	
P	1 470						15.2
U		434					4 4
L			1 175				12 0
H				87			9
E					5 089		52.2
S						768	7 9
PU	102	102					1 0
PL	166		166				1 7
PH	4			4			
PE	178				178		1 8
PS	91					91	9
UL		10	10				1
UH		1		1			
UE		33			33		3
US		1	–			1	
LH			1	1			
LE			56		56		6
LS			12			12	1
HE				4	4		
HS				2		2	
ES					47	47	5
PUL	5	5	5				1
PUE	2	2			2		
PLE	11		11		11		1
PLS	1		1			1	
PES	6				6	6	1
ULE		1	1		1		
LES			3		3	3	
PULE	1	1	1		1		
Number	2 037	5.0	1 442	99	5 431	931	
Percent	20 9	6 0	14 8	1 0	55.6	9 5	100 0

Sample tabulation of DD Form 47 and Standard Form 88. Less than .05 percent

Physical category B The highest proportion of the inductees in category B were so graded because of the E factor Next in order of frequency were the L, P, S H and U factors in that order Of the total number of inductees in physical category B, 86 4 percent had grade 2 in one profile factor only

TABLE 4 *P t distr but on of pby ical cat gor e B and C, by PULHES and ac*

(August 1950 thr gh June 1951)

Pr f l f ctor	P e t distr button					
	Phy l ca gory B			Phy cal ca gory C		
	T tal	Wh t	Negr	T tal	Wh t	N gr
P	15 1	15 6	11.2	15 2	14 9	17 9
U	2 8	3 0	2 0	4 4	4 4	5.3
L	24.4	21.4	48 1	12 0	11 6	17 8
H	3 8	4 1	1 8	0 9	0 9	0 3
E	35 0	36 7	21 9	52 2	52 7	45 6
S	5 3	5 5	4.3	7 9	7 9	8 0
C mb nat of bo fac or	13 6	13 7	10 7	7 4	7 6	5 1
T l	100 0	100 0	100 0	100 0	100 0	100 0

*Sampl tab lat f DD Form 47 d Standard Form 88

Physical category C The frequencies under the separate profactors in category C arranged by order of magnitude were L S U and H Of the total number of inductees in this *92 6 percent had a grade 3 in one profile factor only* 1) There was a racial differential in the distributions of the physical categories B and C by PULHES (table 4) Among the white inductees the most limiting profile factor was E and among the Negro inductees it was L

GENERAL PHYSICAL ASSESSMENT OF THE INDUCTEES

By combining the findings presented above on the distribution of the inductees by physical category (table 1) with those presented with respect to the distribution of the inductees in physical categories B and C by PULHES (tables 2 and 3) the general physical assessment of the inductees shown in table 5 is derived

TABLE 5 *Functional limitations in 1 000 inductees as expressed by PULHES (August 1950 through June 1951)*

Profile factor	Physical categories		Total
	B	C	
P	39	17	56
U	7	5	12
L	51	2	53
H	8	1	9
E	68	44	112
S	14	8	22

UNDERLYING DIAGNOSES

The principal diagnoses responsible for the functional limitations as expressed by the various profile factors of the physical categories B and C, arranged in descending order of frequency, were

Category B

P—Overweight underweight insufficient serviceable teeth, and symptoms referable to limb and back,

U—Curvature of the spine (congenital or acquired) amputated fingers, and limitation of motion of hand and elbow,

L—Pes planus (primarily first and second degrees)

H—Defective hearing, defects of the tympanic membrane, and unilateral deafness,

E—Defective vision,

S—Psychoneurotic disorders (primarily anxiety reaction) and emotional instability

Category C

P—Underweight, inguinal hernia, overweight, insufficient serviceable teeth, and symptoms referable to limb and back;

U—Curvature of the spine (congenital or acquired), amputated fingers, and limitation of motion of elbow,

L—Pes planus (primarily third degree), clubfeet, and internal derangements of knee

H—Defects of the tympanic membrane,

E—Defective vision unilateral blindness and amblyopia

S—Psychoneurotic disorders (primarily anxiety reaction) and emotional instability

The underlying diagnoses were about the same for both B and C physical categories The difference was apparently in the degree or severity, of the impairment

TABLE 6 *P c t d t b t of nduct f sp c f d age by phy l t g*

(August 1950 thro gh June 1951)

Phy c l at gory	Ag g ps (y ar)		
	19-20	21 22	23 25
A	78 6	75 3	69 7
B	14 1	16 6	19 0
C	7 3	8 1	11 3
	100 0	100 0	100 0

Sampl tab la f DD Form 47 nd S.and d Form 88

VARIATION BY AGE

To complete the background on the physical assessment of inductees an inquiry was made as to the possible effect of age on the distribution of inductees by physical category The results of this inquiry are shown in table 6 Even within this narrow age marked differences may be noticed in the distributions by cal categories There was a marked decrease in the propor of physical category A (from 79 percent to 70 percent) when youngest age group (19 and 20 years) is compared with the oldest age group (23 to 25 years) and corresponding increases in the other physical categories, especially in category C (from 7 to 11 percent) The average age of the inductees of this period was 22 years More pronounced differences in the distribution by physical categories may be anticipated with more advanced age groups Shifts in the relative distribution by PULHES also may be expected with advanced ages

THE MANAGEMENT NURSE

MARY I HOGAN *Major ANC USA (1)*

THE management office is a relatively new unit in the Army hospital organizational pattern This office was authorized in 1950 on the authority of Surgeon General's Office Circular 119 and SR 40-610-5 This action was in accord with the move ment in all government agencies toward efficiency and economy of operation The management office was created so that the individual installations might develop and carry on their own programs for management improvement

The mission of the management office is to study hospital operational efficiency, organization, administrative procedures and methods, and to present recommendations for improvements or changes in policy This office prepares budgetary estimates and controls appropriated funds, studies manpower requirements and makes recommendations for allocation of personnel, and provides counseling service in hospital management It operates as a fact finding, planning, and advisory agency, but has no authority to issue orders or directives in its own name

When the concept of the management improvement program for Army hospitals was first considered, far seeing leaders in the Army Medical Service and the Army Nurse Corps saw the need and advantage of including a nurse in the management office personnel Although the nursing service is one of the largest units in the hospital organization, it depends on the services of every unit in the hospital to fulfill its purpose By the same token, problems or changes in any one of the other units affect the nursing service in some way, either directly or indirectly A nurse understands these interrelationships better than those who are not directly concerned with patient care and she is better able to evaluate the implications of the problem for nursing service than is any other member of the management staff

In all large installations and in most of the smaller ones, where active management improvement programs are in operation, a nurse is a full time member of the management staff This has 2 advantages *First* the nurse is freed from the distractions which so often result if she is given additional supervisory or teaching responsibilities and she would, at the same time, be accountable to the chief nurse and the management officer Experience has

(1) Walt r R ed Army Hosp tal W hington D C

shown that any kind of study or research requires time to plan experiment and evaluate The nurse who is busy with administrative or ward activities has little or no time left to do any of these things The *second* advantage is that as a co-worker on problems of supplies procedures or construction the nurse can orient her associates to the nurse's viewpoint

Many of our problems arise from trying to meet today s nursing needs with yesterday s methods and equipment, and in some situations with the day before yesterday s hospital construction The nurse s primary concern as a member of the management staff is to study the problems of the nursing service For the most part her time is expended on developing her own projects problems she studies independently of the other members of the management staff She might for example revise the procedure manual develop an assignment sheet revise the procedures for the care of the dishes on the communicable disease ward or test and evaluate a new piece of equipment Sometimes the nurse is engaged in projects in a consultative capacity An example of this type of project might be on the study of hospital housekeeping which entails the transfer of certain duties to the custodial group She would appraise the ward situation and make recommendations as to which duties should be retained by the nursing personnel because of the patient s welfare She might participate in some large research project which engages the services of the entire management office An example of such a project might be an experimental study to develop a technic for the analysis of ward duties as a means for establishing staffing standards

These examples should leave no doubt that a nurse is needed in the management office There is no danger that her professional ability is being wasted in a so-called non nursing assignment Problems requiring study are generally referred to the management office, through channels by the chief nurse This is in accordance with good procedure and is essential if the management nurse is to be of greatest value to the nursing service Close liaison between the management office and the nursing service is the answer to a successful management program as far as the nursing service is concerned The term nursing problems should not be construed to mean such matters as where to get new curtains for the day room how to get a cabinet built or why the linen counts are short If the management nurse has some influence or can assist the ward nurse in any way she should do so but for her to engage exclusively in such matters would be to place her in the role of a trouble shooter If only such problems were given to her a Let George do it" situation would soon develop and she would be expected to play the unenviable role of George

This following study shows how the management office and the management nurse assisted the nursing service A standard operating procedure was desired for one of the neurosurgical wards The best possible nursing care is only a concept until it is translated into appropriate activities The problem involved determining what is good nursing care on a paraplegic ward, and developing a ward administrative plan which would provide such care The management office personnel studied the ward situation for 2 weeks Before any concrete plans could be laid it was necessary to answer the following questions

1 Are the personnel qualified by training to do the tasks assigned to them?

2 Is a sufficient number of hours of nursing care, both professional and nonprofessional provided?

3 How much and what kind of supervision is available to the nursing personnel?

4 Is there a training program for workers?

5 Are scientific principles followed in giving treatments?

6 Are doctors' orders carried out accurately and promptly?

7 What is the accident record of the ward?

8 Are the physical facilities adequately arranged and managed?

9 Is there an organizational pattern which clearly shows the lines of authority and responsibility?

10 Are specific duties assigned to ward personnel?

11 Are the patients' physical, emotional and spiritual needs being met?

12 Are economy of time, energy, and supplies considered?

13 Is the workflow smooth?

Another matter of high priority was to determine the various components of the nursing care requirements of neurosurgical patients The management nurse evaluated all activities relating to (1) control of environment, (2) mental adjustments, (3) nutrition, (4) elimination, (5) rest, sleep, and personal hygiene, (6) position, posture, and exercise, (7) record of patient's responses to treatments and medications, and (8) conditioning for recovery and health She investigated each activity with regard to the safety and comfort of the patient and present and long range

therapeutic effect The patient load and workload were studied Information was collected on the length of time spent by the personnel in performance of such nursing care activities as giving baths taking temperatures giving irrigations, turning the Stryker frames et cetera This information revealed that the existing staff needed to be augmented by additional workers if all of the necessary measures were to be accomplished

Ward facilities and the workflow were jointly studied by the management personnel From this came many changes in the ward which made for better working arrangements The management nurse consulted with the engineer for special pegs and rods for irrigators By the time that the study was terminated, a pattern for nursing care and a ward operating plan had been developed which made the best possible nursing care an actuality The program included a plan for the head nurse in the management of her ward and supervision of the personnel The duties of the ward nurses were defined and responsibilities were clearly established work assignments were developed which coincided with the training and qualifications of the workers schedules for treatments and the turning of Stryker frames were worked out and lines of supervision and channels of communication were defined This study established a method for developing a ward administrative plan which could be used as a pattern for developing a standard operating procedure for any type of ward

It should be apparent that the management nurse is primarily a research investigator She must be able to use the technical skills and tools of research She needs to know the differences between the mean median and mode and why one would be used in preference to another in evaluating certain data She should be able to look at figures objectively because they will either confirm or disprove her assumptions She needs to be able to (1) define a problem so that a workable solution can be devised (2) prepare a questionnaire and (3) organize and tabulate figures She is not expected to be an expert statistician but she should know enough about is so that she can decide when she needs the assistance of a consultant in that field

Sound analysis of findings requires observation and judgment Many studies may be concerned chiefly with qualitative aspects because research is not necessarily statistical or quantitative With these tools the management nurse can approach her job with security She will grow on the job and will be able to operate independently or to participate effectively in group undertakings

HYPERTROPHY OF THE HEART OF UNKNOWN CAUSE[1]

JOHN B SELBY *Captain MC USA*

LeGRAND H THOMAS *Captain MC USA*

OCCASIONAL cases of extreme cardiac hypertrophy are seen without evidence of physiologic or anatomic defects to explain them These have continued to prove puzzling, and one of the heaviest hearts of modern times, 1,475 grams, was not adequately accounted for as to pathogenesis (2). A large number of these cases have occurred in young adults Perhaps some of these could be explained by glycogen storage (von Gierke's) disease, myocarditis of unknown cause, coronary anomalies, and excessively rapid rates in paroxysmal tachycardia, but careful study along many of these lines has not been productive Norris and Pote (3), for example, could find no common factor or evidence of any cause for their 4 cases of congestive failure, hypertrophy, and dilatation of the heart Their patients were all men between the ages of 21 and 30 years who had been in the armed services One of these had known of this cardiac hypertrophy for 20 months before death, but the others had signs or symptoms referable to the cardiovascular system for shorter periods Roentgenograms of the chest were normal in these patients and their past history was under closer scrutiny than that of the average adult

As was to be expected in young servicemen their health had been excellent, and it seems wholly unlikely that they could have so called congenital idiopathic hypertrophy of the heart The heart weights in this series were 890 560, 550, and 540 grams Levy and Rousselot (4) reported unexplained cardiac hypertrophy in 3 men aged 18, 21 and 29 years The duration of their illness from the onset of incapacitating symptoms to death was less than a year in each How long hypertrophy was present before the onset of discomfort was not known, but all of these cases indicate

(1) Valley Forge Army Hospital Phoenixville P

(2) Gold J S and Beams W A. Extreme cardiac enlargement Am. Heart J 13 207 216 Feb 1937

(3) Norris R F and Pote H. H Hypertrophy of heart of unknown etiology in young adults report of 4 cases with autopsies Am Heart J 32 599-611 Nov 1946

(4) Levy R L and Rousselot L. M. Cardiac hypertrophy of unknown etiology in young adults clinical and pathological study of 3 cases Am. Heart J 9 178-195 Dec 1933

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a progressive process and it seems highly unlikely that a congenital defect could be responsible They cite Whittle's (5) case of a previously healthy 20 year-old student who died suddenly while riding a bicycle His heart weighed 840 grams and his thymus 30 grams His aorta was delicate and of small caliber measuring 16 mm at the beginning of the descending portion The average normal aorta at this level measures 23 mm Although the hypoplastic aorta was not considered to be a primary causative factor, it is interesting because of the small but not definitely abnormal aorta found in the case to be presented here

CASE REPORT

A 21 year old man was called to military duty on 12 August 1950 for a 2 week training period at Fort Dix N J On 14 August he developed nausea and on 15 August he noted pains in the upper abdomen radiating through the lower chest region These pains were not severe but were associated with profuse sweating weakness and anorexia On 19 August while at home on pass he developed dyspnea He returned to camp and reported on sick call where he was given sodium bicarbonate tablets on 21 August. A cough developed and the dyspnea became worse On 26 August he had finished his training period and was driven to Newark Air Force Base to leave for his home He felt so ill and was so dyspneic that he was seen by a medical officer, who ordered that he be sent back to Fort Dix and hospitalized as an emergency

On admission to the U S Army Hospital, Fort Dix, N J he was acutely ill orthopneic and perspiring profusely, but there was no cyanosis There was slight venous distention in his neck and a few crepitant rales were noted at the bases of his lungs His left cardiac border extended to the anterior axillary line, and there was a tick tock rhythm No murmurs were heard His liver was palpable and slightly tender His blood pressure was 100/80 in the right arm, 102/80 in the left arm 100/80 in the right leg and 130/90 in the left leg He denied any previous knowledge of heart disease rheumatic disease growing pains frequent nose bleeds or serious sore throats, but stated that he had a morning cough of 2 months duration which became productive of a small amount of yellow green sputum about a week before the onset of his present illness His leukocyte count was 17 000 His antistreptolysin titer on 7 September was between 1,200 and 1 400 units per cc On 27 November it was between 200 and 250 units per cc His antifibrinolysin reaction was 3 plus on 7 September Several sedimentation rates were determined and all were normal Serum proteins were 5 7 grams per 100 cc on 21 September with a normal A/G ratio Repeated throat cultures showed predomi

(5) Wh I C. H. Id opathi hype tr phy f heart y ung man. La t 1 1354-1355 June 29 1929

nantly neisseria and some *Escherichia coli* A blood culture was negative A roentgenogram of the chest on 26 August showed gross enlargement of the heart shadow in all dimensions, the shape being such as to suggest a pericardial effusion ECG's showed the T waves to be flat in lead aV_L and inverted and di phasic in leads I, II, III, aV_F, V_5, and V_6

The patient was given meralluride injection and penicillin on admission He was digitalized on 2 September He complained of diplopia, and diphtheritic myocarditis was considered but this was not substantiated by throat cultures On 2 September his peripheral pulse became almost imperceptible and he had signs of cardiac tamponade An attempted pericardial tap was unsuccessful On 2 December he developed a cough and a purulent postnasal discharge Treatment with penicillin, which had been discontinued, was resumed and aureomycin was given His rectal temperature had risen to 104 F by 3 December, but in the next day and a half his temperature dropped to normal and remained so

He was transferred to this hospital on 4 January 1951 He was not acutely ill on admission A roentgenogram of his chest showed his lungs to be clear but his cardiothoracic ratio was 17 29 P_2 was accentuated There was a soft, grade I systolic murmur at his apex, a gallop rhythm, and a pulsus alternans His blood pressure in the right arm was 110/78 and in the right leg 110/88

A copy of his pre enlistment examination on 30 September 1947 was obtained from the Air National Guard A roentgenogram of the chest was not available, but the medical examiner stated that the cardiovascular system was normal, the blood pressure was 118/74, and the resting pulse was 72 The patient stated that on his physical examination in 1947 he had had to sit and rest awhile and be re-examined with respect to his heart several times before being passed His wife also stated that for 4½ years she had noted that at night his heart pounded forcefully and rapidly, and the patient confirmed this

During his hospital stay his leukocyte count ranged from normal to 15,050 on 15 January Sedimentation rates were repeatedly normal He was given a course of 1 6 grams of cortisone over a period of 15 days ECG's revealed a grade I heart block and T-wave inversion in leads I, II, III, aV_F, V_5, and V_7 On 23 January these changes were less pronounced This was thought to be the result of the withdrawal of cortisone Except for digitalis effects and episodes of rapid sinus tachycardia, there were no changes in repeated ECG's Roentgenograms were made in an attempt to view the aorta, but the aortic arch was not clearly seen in both oblique views

On 9 Februarv he started receiving 600,0
every 6 hours He had no fever during this t
for congestive heart failure He seemed to r
until his sudden death on 31 May He was see
prior to death by the patient in an adjoining
he appeared to be in good spirits

At autopsy there was no pleural or peritonea
cardial sac contained about 150 cc of clear str
The heart was greatly enlarged and weighed 78
anterior surface of the righ ventricle there was
of milky opacity measuring 4 by 5 cm and a simi
cardial thickening was present on the posterior
right ventricle The right auricle was enlarged T
was small and grossly normal The myocardium sho
abnormalities In the left ventricle on its endoca
at the base of the trabeculae carneae there were s
hyaline patches of endocardial thickening measurin
less in diameter The leaflets of the mitral and tricus
were diaphanous and the chordae tendineae were thin
and semitransparent. The aortic ring was normal The
arteries were patent throughout The mitral valve measure
the pulmonic, 9 cm and the tricuspid 14 cm The left
ular wall was 18 mm thick at the base of the mitral valv
right ventricular wall was from 8 to 10 mm thick The aort
smaller than normal It measured 6 5 cm in circumference a
aortic ring and 3 5 cm just above the renal vessels These m
urements are within the normal range for this age The wall a
appeared thinner than normal but there were no areas of lo
ized constriction or point of apparent obstruction to blood flo
he intimal surface was smooth and glistening The common ilia
essels also appeared proportionately decreased in size

On microscopic examination the myocardial fibers were moder
tely enlarged In some areas their nuclei were large, dark and
stellate The endocardial nodules noted grossly consisted of
nodular subendocardial fibrosis without cellular infiltration Some
of the small muscular myocardial arteries and the secondary divi
sions of the right and left coro ries showed hyperplasia
of the subintimal fibrous conne e The pulmonary artery
and aorta showed similar subin sis, but were otherwise
normal Hemosiderin laden mac ere diffusely scatter
throughout the parenchyma of Many of the smalle
pulmonary arter arterioles ed walls Except
some sparing tal are s diffuse vacuola
of the parenc of the ntral venous s
were moderat There nal slight ly
cytic infiltrati rtal tri

DISCUSSION

von Bonsdorff (6) reviewed several cases described in the French and English literature and then cited 9 similar cases in a series of 5,848 hearts examined post mortem He attempted to analyze the role that preceding respiratory infections, trauma, tuberculosis, et cetera, might play in these cases He noted that temporary enlargement of the heart after influenza was mentioned in the literature several times This functional decline with dilatation could lay the basis for a permanent heart disease At any rate "if the heart disease continued and lead to the patient's death, it may happen that the morphological heart findings—apart from the dilatation and the hypertrophy which it conditions—are very insignificant, at least with the investigative means at our disposal" This concept is mentioned in some detail because most etiologic discussions include a group of conditions with which we are pathologically familar and can discern on post-mortem examination

In the present case the search for the usual causes was frustrating A respiratory infection sufficient to injure and dilate the heart should be sufficient to make the patient seek bed rest for a few days at least. This patient's mildly productive cough did not. The leukocytosis of 17,000 observed on his initial hospital admission could, however, have been caused by a streptococcal infection which might still have been active at that time This raises the question of the patient having a poststreptococcal carditis similar to that found by Rantz et al. (7) in men convalescing from hemolytic streptococcic sore throat who presented no clinical evidence of a continuing pathologic process In all these cases which were discovered by abnormal ECG's, the sedimentation rate was elevated and usually remained so for 3 or more weeks We have good evidence against previous hypertension in our patient Palpitation was an early and prominent symptom This was noted in several previously reported cases but was not necessarily significant or related to episodes of tachycardia Our patient, like Whittle's, had a small, delicate aorta, but the measurements of our patient's aorta were within the normal range

Davies et al (8) reported 9 patients with heart disease of unknown cause, most of whom complained initially of a "cold" Closer questioning revealed that these symptoms were actually those of incipient heart failure In their group there was a striking

(6) von Bonsdorff B. Myocardial disease of obscure origin. Heart disease of unusual or unknown origin. Acta Med. Scandinav 100: 403-435 1939

(7) Rantz L. A. Bonsvert, P. J., and Spink, W. W. Hemolytic streptococcic sore throat; poststreptococcal Arch Int Med 79: 401 435 Apr 1947

(8) Davies R. R. Marvel, R. J. and Genovese P. D. Heart disease of unknown etiology Am Heart J 42 546-565 Oct. 1951

similarity in the clinical course and physical findings, and these were similar to those of the case presented here They observed that pericardial disease was a perplexing problem in differential diagnosis In our patient, roentgenographic evidence was so suggestive of a pericardial effusion that a tap was attempted which was unsuccessful Several consultants saw our patient and believed that he probably had a rheumatic myocarditis despite the normal sedimentation rates One suggested the possibility that this was one of the cases of idiopathic cardiac enlargement that have a poor prognosis in young people

SUMMARY

A previously healthy 21 year old soldier developed cardiac hypertrophy of unknown etiology The elapsed time between the onset of definite cardiac symptoms and death from congestive heart failure was 9 months The enormous heart showed no significant gross or microscopic findings except subendocardial fibrosis The aorta and great vessels seemed small for a man of his size but measurements were within normal limits Comparison with previously reported cases of cardiac hypertrophy of unknown cause shows a similarity in clinical course but adds nothing to the possible cause The present case had some evidence of a preceding streptococcal infection Cortisone was used in the treatment but no benefit was demonstrated

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BOOK REVIEW

Laboratory Technique in Biology and Medicine by *E V Cowdry* Research Professor of Anatomy and Director of Wistar Cancer Research Laboratory Wistar Institute University of Pennsylvania Second edition 382 pages The Williams & Wilkins Co Baltimore Md publishers 1952 Price $4

This book on laboratory technic contains descriptions of hundreds of procedures which are often difficult to find unless a large library is available Even to those who have immediately available a large scientific library it will be extremely valuable as a quick reference book and a great timesaver because almost all of the technics are given in detail arranged in alphabetical order and cross indexed References are given on all procedures listed and also on those few not given in detail The tremendous amount of technical data regarding stains given here should prove valuable to all pathologists and microscopists whether engaged in research or employed as technicians This recently revised edition is highly recommended for all hospital laboratories

—*Comdr R H Walker MC USN*

EXPERIMENTAL SUBPERIOSTEAL DENTAL IMPLANTS

ROY L BODINE Jr *Colonel DC USA (1)*

RAYMOND L KOTCH *Captain DC USA (2)*

THERE is tremendous interest today in subperiosteal dental implants for supporting prosthodontic appliances, especially as a means of restoring mastication for the patient who cannot tolerate conventional dentures Although dental implants are not yet widely accepted, a controversy has begun about which much will be heard in the near future The argument against the dental implant centers around the fact that there is a projection through the mucosa into the mouth, which causes a breal in the epithelial covering of the body and is incompatible with health

A histologic study of the tissue around dental implant abutments was presented by Ph llip Loechler, before the Implant Academy at St Louis in October 1952 He found that the crevice around an implant abutment is a normal gingival crevice lined with squamous epithelium and connective tissue It occupies only one third the length of the post which is shallower than the gingival crevice around a natural tooth There are fewer inflammatory cells around an implant abutment than around a natural tooth This proves, according to Loechler, that there is no leakage around the abutments if the steps of the procedure are properly performed Much more work remains to be done before anything definite can be decided, Clinically, implants are successful, and no pathway into the body appears to exist, Bernier and Canby *(3)* suggested that because of the nature of oral tissue, an abutment protruding into the mouth may not be comparable to a protrusion externally into air

Treatment of the patients here described was undertaken in the hope of contributing to the advancement of knowledge in the growing field of dental implants and of solving difficult prosthodontic problems Two of these patients had marked resorption of the alveolus and were provided with full lower implant

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(1) Pos dental surgeon and pr sthod ti t Camp Gord n G

(2) U S. Army H sp tal Camp Gord n G

(3) B n t J L and Canby C. P Hi st logi studies on resection of alveolar l n to r tain um mplant J Am Dent A. 30 188 197 Feb 1 1943

dentures The other 2 were provided with 3 single tooth implants in place of fixed bridgework In regard to the single-tooth implants, it is too early for evaluation

CASE REPORTS

Case 1 A 28 year old woman came to the dental clinic complaining of an unsatisfactory lower denture There was no retention and she suffered pain at numerous places on the denture bearing area The alveolus was almost completely resorbed, leaving only a small spiny ridge covered by dense fibrous tissue Several attempts at achieving a successful lower restoration had been unsuccessful The principles of the implant denture emphasizing its experimental nature, were explained to her Because of her many masticatory difficulties with conventional lower dentures she was eager to try an implant.

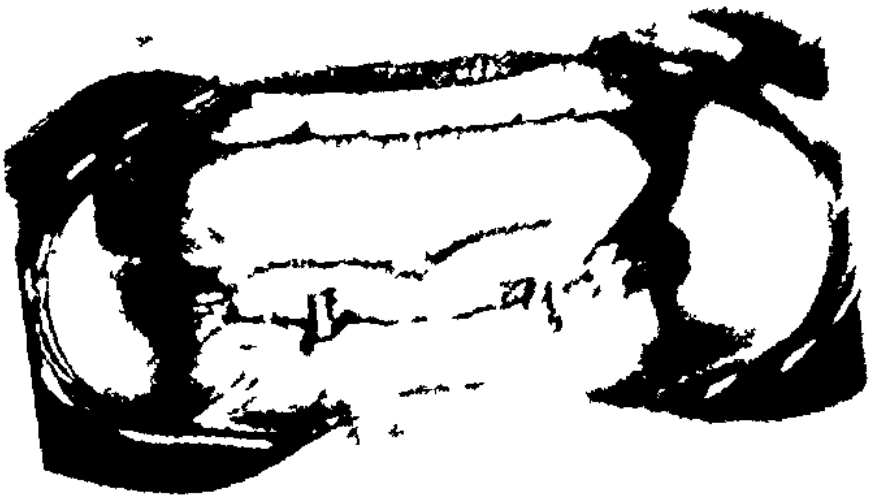
The method chosen was Killebrew s *(4)* improvement of the now obsolete technic described first by Goldberg and Gershkoff *(5 6)* Sterile measuring pins were inserted through holes in an acrylic baseplate into the anesthetized mucosa until bone was struck These measurements were then transferred to corresponding areas of a conventional cast and the latter relieved accordingly over the implant area in effect attempting to remove the thickness of the mucosa from the cast The implant was then constructed of vitallium meshwork with provisions for 2 screws to immobilize it during the healing period

When the mucoperiosteum was elevated and the implant seated on the bone it was found to lack close adaptation at several points This was related to the relatively inaccurate method of relieving the stone cast on the basis of measured probing After removing the spiny ridge and adjusting the casting to the best possible fit the meshwork with its 4 abutments was secured by a small screw on each side and the flap replaced and sutured Healing was somewhat protracted and resuturing of the incision was required at 2 points

During 11 months of follow up there have been occasional short periods in which one or another of the abutments became tender probably because of the lack of a good fit against the bone The patient has, however been exceedingly happy as she can masticate far better than with her previous dentures (figs 1–3)

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(4) K ll br w R T bl Cl ss Am ca D ntr Soc ty Ch cago ll F b 1950
(5) Goldberg, N I d Ger hk ff A Impla low d ur D l Dige t 55 490-494 N 1949
(6) Goldbe g N I nd Gershk ff A. F h p rt on full l w i pla d n D tal Dig t 56 478-483 N 1950



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2



3

Case 2 A 23 year old man with marked resorption of the maxillary and mandibular alveolar ridges was seen This condition was believed to be due to multiple endocrine deficiencies The mandible provided no support for a satisfactory denture which had been attempted without success In this case an improved technic first described by Berman *(7 8)* and now generally accepted was used A surgical impression is made directly on the exposed bone and the meshwork is extended buccally and lingually over the contour of the mandible Two surgical operations were required In the first after elevating the periosteal flaps an impression was taken with low fusing compound in a previously prepared acrylic tray directly on the exposed bone surface

The second operation for the insertion of the implant was performed 2 weeks later As a result of the accuracy of the direct surgical impression and the extension of the implant meshwork buccally and lingually over the curvature of the mandible the implant meshwork fits the bone perfectly with no tendency to lateral displacement Although not considered essential in this case as an extra precaution a short screw was placed on each side between the abutments before the flaps were sutured Most remarkably there was no tenderness to the abutments the patient using them in mastication after 2 or 3 days Healing was rapid although posteriorly it was by granulation rather than by first intention The superstructure was completed and inserted 4 weeks after the surgical insertion of the implant Because this patient was a dental technician daily observation was possible Mastication improved remarkably up to the limits of function imposed by the upper denture where similar resorption has occurred An upper implant denture may be made later (figs 4–6)

Cases 3 and 4 These 2 patients had 3 single-tooth implants for acrylic jacket crowns It was expected that a successful result would avert the necessity of invading the adjacent teeth for conventional fixed bridgework From these small implants much might be learned about implants in general which could be used in treating those patients requiring full arch implants An original technic was developed in which a butterfly shaped meshwork was placed between 2 natural teeth carrying an abutment on which a gold core acrylic jacket crown was constructed Although it is too early for a final evaluation of the results all 3 implants were highly satisfactory at the time of writing (figs 7–10)

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(7) B man, N Impla t te h que for t ll low de ur W h gt De t J 19 15-17 Dec 1950.

(8) Berma N Phy log nd me ha cal pe of impl h que nd pplicatu pra cal De tal D g 58 342 347 A g 1952





Figure 4 (case 2) Photograph taken 4 months after placing the implant. Note absence of buccal vestibule Figure 5 (case 2) Superstructure in place Note great occlusal height above resorbed alveolus. Figure 6 (case 2) Roentgenogram showing implant which fits perfectly against the bone Note buccolingual width offering resistance to lateral stresses.

because the periosteum must lie over the implant meshwork *so that regeneration of the connective tissue fibers* which cement the periosteum to the bone will hold the implant firmly in place Any sharp bony ridges spines, or irregularities are trimmed and smoothed The lingual flap is retracted and secured by 1 or 2 sutures across the mouth under the tongue The buccal flap may be similarly secured to the cheeks if necessary

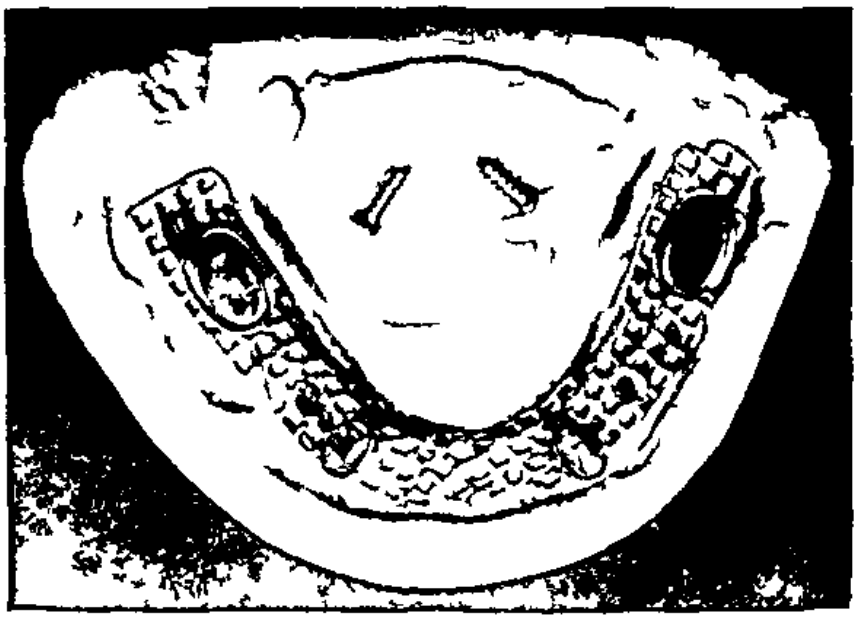


Fig e 11 F ll lowe impla t Not op n meshwork and b cco l gual width Thi ca t wa made fr m a d rect urgical mp ssion.

The impression is carefully taken in the compound lined rylic tray to include all of the exposed bone It is sometimes helpful to cut the tray into 2 sections take the impression of the right and left sides separately, and join them together in the mouth by an impression over both The buccal and lingual flaps are replaced and the incision closed with interrupted sutures Retention sutures should also be inserted to resist the expected edema which might separate the lips of the wound in the succeeding 48 hours Postoperative care includes cold compress to the face to reduce edema penicillin procaine or other suitable antibiotic liquid diet for 48 hours codeine intramuscularly for pain and complete bed rest for at least 48 hours The sutures are removed on about the fifth post-operative day

The *implant meshwork* should cover all of the exposed bone It must be brought over the contour of the mandible to produce a secure seating and resist lateral stresses The implant must combine minimum bulk with adequate strength and rigidity The edge must be thin and close against the bone It may be a

irregular as necessary Strengthening, if required, should not be placed at the edge, but midway between the crest and the buccal or lingual border Many differently shaped abutments can be used They may be tooth shaped for clasps or parallel sided for a precision fitting In either case, they should be short of occlusion so that the occlusion is restored entirely by the superstructure Healing is most rapid if the abutment is straight sided without a collar projecting over the tissue (fig 11) Because the implant is usually reserved for patients with severe alveolar resorption, the position of the mental foramen is relatively much higher than in the normal mouth Adequate relief in the edge of the implant must be made to avoid the mental structures Screws, if used, should be short enough to engage only the cortex of the bone Penetrating the substantia spongiosa may endanger the mandibular canal

The *surgical insertion* is performed 2 or 3 weeks after the surgical impression is made in order to allow for complete recovery from the effects of the first operation The technic for raising the flaps for the insertion is the same as described for the surgical impression, the incision being made in the same line The periosteum is easy to elevate because it has not yet become firmly reattached to the bone Fixation of the implant may be achieved by 2 short screws, 1 on each side, or preferably by circumferential wiring The screws should be removed after about 6 weeks but the circumferential wires may be left in permanently In order to combat the swelling that follows such a large elevation of the periosteum, several mechanical methods are used including the placing of an acrylic splint immediately over the implant *(9)* the winding of elastic bandage around the chin for the first 48 hours *(10)*, and the placement of deep retention sutures well into the muscle between abutments

The *superstructure* consists of a framework with clasps or a precision female capping joined by rigid connectors *(11)* The connectors must be high enough to clear the healed tissue without interfering with tooth placement Acrylic, porcelain, or metal teeth of any kind may be used As the stresses on the superstructure are borne entirely by the implant abutments, the buccolingual width should be minimal with the lightest possible tissue contact (figs 12 and 13) The superstructure must fit

(9) Lew L Simplified upper technique using immediate prostheses Dental Digest 58 10-15 Jan. 1952

(10) Brauman N Implant technique for full lower denture Dental Digest 57 438-443 Oct 1951

(11) Goldberg N I and Gerkhoff A Fundamentals of implant denture J Prosthet Dent 2 40-50 Jan 1952

with the notion of self is the notion of purpose A chapter on the primary entities of psychiatric discourse (awareness, conscious ness the self, thought and mind all of which chiefly concern mechanism) is followed by a chapter on the secondary entities of psychiatric discourse which are designated as personality char acter morale the group and the containing society The author discusses his classification of clinical entities which with some exceptions is more or less conventional His treatment ori entation is broadly eclectic and all inclusive The management of a specific case is cited

—*Lt Col W J Barker MC USA*

S gery of the Eye by *M y W* M D Eme itu Prof r f Cli ic l Ophth lmol gy W h gto Un s ty S h ol f M d i H orary C lt t Ophth lm logy Bu u of M dic a d S g ry Depart m t of th N vy d *Ha ld G Scb* M D D Sc F A C S A s t P f s r f Ophthalm logy The Medic l Scho l d Hos p t l d A ta t P fe r of Ophth lm l gy Grad t Scho l f M d Un sity of P n yl Ophthalm log t Th Ch ldren H sp t l of Philad lph 3d r vi d ed t 449 p g ill trated. Gru & Stratto In New Yo k N Y p bl h 1952 Pn $15

This excellent textbool should be available to all phvsicians who perform minor or major operations on the eye The illustra tions are clear and instructive The organization of the material is excellent The discussion is reasonably brief but contains much sound information which can be obtained quickly The chap- ters dealing with cataract and glaucoma are unusually good but those dealing with operations on the lids and socket should be vised to exclude surgical procedures which are out of dato and lude such newer ones as the Hughes operation for the replace nt of the lower lid the Halving operation for closure of lid efects the Butler operation for spastic entropion and the pro- cedure reported recently bv Smith for repair of the outer canthus On page 323 figures 310 and 311 show two methods for removal of the lateral orbital wall These methods have been replaced by the use of a nonrevolving Stryker bone saw A revolving bone saw is dangerous and difficult to use The Kronlein procedure recently reported by Reese has been modified sufficiently to make it a most useful procedure in removal of orbital tumors and decompression of the orbit This modification should be included in all surgical textbooks In the chapter dealing with muscle surgery the illustrations should show the use of absorbable suture material Some of the operations performed on the oblique muscles as advocated by Berke and Fink should be included in this book A discussion of operations for dacryocystorhinostomy seems incomplete without the inclusion of the excellent intra nasal procedure advocated by Jones

—*Col M J Reeh USAFR (MC)*

REMOVAL OF A CYSTIC CALCULUS FROM A DOG

DALE C MOWBRAY *Captain VC, U S A*

JAMES N SHIVELY *Captain VC, U S A*

A 10 year old, 19 pound fox terrier was admitted to the Army Section of the Territorial Animal Quarantine Station, Honolulu, Hawaii, on its arrival from the United States to be held for the 120 day quarantine period required by Territorial law Symptoms noted at this time were those of uremia and the frequent passage of small quantities of blood stained urine



Figure 1

The diagnosis of cystic calculus was confirmed by roentgenogram, and a 6¼ ounce stone was surgically removed (fig 1) The calculus, which was of the alkaline type, measured 3 inches in length and 1 3/4 inches in diameter, thus making it one of the largest ever found in a member of the canine family The animal made a rapid and uneventful recovery and was released from quarantine in apparent good health

BOOK REVIEW

The Bio hemistry of Gastric Acid Sec tion by *Edwa d J C way* M D D Sc F R S P of s f Bi ch m stry a d Ph rmac l gy U r- rsity Coll ge D bli I la d Ho orary F llow R y l C ll g f Phys cian Irela d P bl t n No 119 Am L ture S A M graph s Th B n st D is n f Am c L ct res in B h mistry nd B ophy ics Edit d by W Bl d gro I (DELFT), M A Ph D Sand Ltd Basl Switz la d 185 pag ll trated Cha l C *Thoma P bl he Sp gf ld Ill 1952 Price $6 50*

This monograph presents to the reader a composite review and correlation of selected research data on gastric acid secretion as published in current journals The author has made an excel lent presentation of the probable physiologic and biochemical origin of the secretions of the gastric mucosa and the controls thereof Evidence is presented for the conclusion that the parietal canaliculi of the gastric mucosa are responsible for the secretion of HCl The experimentlv determined relation between the milli equivalent concentration of Cl NA K and the milliequivalent of the resulting gastric acidity is discussed The extent of secretion of HCl is mathematically presented on the basis of a redox theory concluding that the parietal secretion containing HCl has always a total concentration isosmotic with the blood

Experimental stimulation of the parietal cells and the probable site of action of psychic and chemical phases of stimulation are y and adequately discussed The secretion of the hydrogen and its relationship to the ionic components of the inter l and extracellular fluids is also explained The author several experimental facts illustrating the similarity of the production of acid in yeast and in the gastric parietal cell and points out that in each instance acid secretion leads to an equivalent intercellular alkalinization Other theories of HCl production are also considered The energetics of gastric secre tion are discussed in detail

The intercellular and extracellular role of gastric *urease* is described Points of corroborative evidence on comparative phys ologic mechanisms between various animals and yeast are in cluded to substantiate the concepts of the activities of the gas tric mucosa presented This book should be of great interest to investigators and students in this field

—Maj W H Lee USAF (MSC)

CALCIFIED COSTAL CARTILAGE

KARL A YOUNGSTROM *Lieutenant Colonel MC USA*

VARIATIONS in the number, length, and shape of ribs are well known, but usually they cause no symptoms Notable exceptions are some cervical ribs and the changes in the rib cage associated with a severe degree of sternum recurvatum The present case is interesting because of the associated symptoms

CASE REPORT

The patient was admitted to the 8th Station Hospital, Kobe, Japan because of diarrhea He had some tenderness in the right upper abdominal quadrant Several roentgenograms were made and a calcific density was seen overlying the right upper quadrant, the exact nature and relations of which could not be determined from that study (fig 1) Stereoscopic views later proved the density to be bilateral in the anterior abdominal wall in line



Figure 1 Black arrows show the calcified tenth costal cartilages. There are two areas of calcification in the right tenth costal cartilage

with the continuation of the tenth ribs The one on the right extended much further toward the midline than that on the left. By the time these studies were completed, the patient had recovered

from his diarrhea but the abdominal tenderness persisted in the region of the tip of the right tenth rib Further questioning revealed that he had noted this type of pain on several occasions in the preceding years and had associated its appearance with violent exercise such as throwing a baseball

A surgical consultant recommended a resection of the distal portion of the right tenth rib This operation was performed and an irregular cartilaginous growth forming a sharp tip pointing upward was found in the distal portion of the rib Another small area of irregular cartilaginous growth was just proximal to this These two areas formed about 4 cm of excessive growth toward the midline It was believed that the patient s pain was due to the distal portion of this rib irritating and elevating the sheath of the right rectus muscle The external oblique muscle was incised to expose the more proximal portion of the rib The distal 5 cm of the rib was removed and the cut end of the rib was rounded with a bone rasp Six weeks after operation the patient was symptom free even while throwing a baseball

CONCLUSIONS

An unusual anatomic variation in the form of an elongated tenth rib traumatized the rectus sheath during contraction of the muscle This case illustrates the advantage of stereoscopic roentgenograms in localizing the cause of the patient s symptoms An unusual cause of pain in the right upper abdominal quadrant is reported

BOOK REVIEWS

Pharmacology in Clinical Practice by *Harry Beckman* M D Director Departments of Pharmacology Marquette University Schools of Medicine and Dentistry and Consulting Physician Milwaukee County General Hospital and Columbia Hospital Milwaukee Wis 839 pages illustrated W B Saunders Co Philadelphia Pa publishers 1952

This book was written to supersede the author s well known "Treatment in General Practice " It is intended to teach second year medical students to "think in terms of specific diseases and the opportunities they present to the pharmacologist, in terms of symptoms" rather than to employ more customary methods which the author believes are incorrect and are "based on the promise that to fill a young man with scientific facts regarding a large number of drugs would equip him to use those drugs subsequently in the treatment of his patients " Much of the book is concerned with descriptions of the cause, frequency, symptoms, and lesions of numerous diseases, often concluding with a statement such as "This subject has no pharmacological aspects " Without judging the adequacy of this material, ordinarily covered in textbooks of internal medicine, I believe that this approach may be of value to the practitioner but under the present system of medical education it is not suitable for second year medical students The material is up to date and well indexed so that one may find the essential actions and uses of important drugs even though they be scattered throughout the book

—*Lt Col P A Smith, USAFR*

Physiology of the Eye Volume II Vision by *Arthur Linksz* M D F A C S Assistant Clinical Professor of Ophthalmology New York University Postgraduate School of Medicine Associate Attending Surgeon Manhattan Eye Ear and Throat Hospital New York N Y 869 pages illustrated. Grune & Stratton Inc New York, N Y publisher 1952 Price $19

This exhaustive treatise is written for the student and not the casual reader in ophthalmology It is probably the most complete work in the field today and is a "must" for the student desiring a thorough knowledge of the complicated processes of vision Part I is devoted to an analysis of sensations, beginning with the adequate stimulus and developing in an orderly fashion the physical and psychologic aspects of vision Color

from his diarrhea but the abdominal tenderness persisted in the region of the tip of the right tenth rib Further questioning revealed that he had noted this type of pain on several occasions in the preceding years and had associated its appearance with violent exercise such as throwing a baseball

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The History of American Epidemiology by *C. E. A. Winslow* Dr P H Professor Emeritus Yale University School of Medicine Editor American Journal of Public Health *Wilson G Smillie* M D Professor and Chairman Department of Public Health and Preventive Medicine Cornell University Medical College *James A. Doull* M D Medical Director Leonard Wood Memorial (American Leprosy Foundation) *John E Gordon,* M D Professor and Chairman Department of Epidemiology School of Public Health Harvard University Edited by *Franklin H Top* M D Professor of Epidemiology and Pediatrics College of Medical Sciences University of Minnesota Sponsored by *The Epidemiology Section American Public Health Association.* 190 pages illustrated The C V Mosby Co St Louis Mo publishers 1952

This monograph by 4 distinguished leaders in the field of preventive medicine and public health relates the development and progress of American epidemiology in its broadest sense Developments occurring elsewhere in the world are taken into account. Only short sections of this book are written in a purely narrative style whereas most of the book is devoted to a discourse on pertinent events, discoveries, and the 'thinking of the day" with a discussion of their impact on the course of the evolution of epidemiology in this country This book will afford interesting and enjoyable reading for all persons interested in preventive medicine and public health

—*Col A b Scheele MC USA*

Nutrition and Diet in Health and Disease by *James S. McLester* M D Professor of Medicine Emeritus University of Alabama and *William J Darby* M D Ph D Professor of Biochemistry and Director of the Division of Nutrition Vanderbilt University 6th edition 710 pages illustrated W B Saunders Co Philadelphia Pa publishers 1952

This new edition appears to be planned for the use of nutritionists The material is presented in a concise, understandable form Unlike many other texts on nutrition it omits historical data and is restricted to information of practical value Each chapter has an extensive bibliography

The section on normal nutrition briefly reviews the digestive processes, utilization of food and caloric needs before discussing each class of food in a separate chapter Tables are used in great numbers to demonstrate the values of various foods in each category An interesting addition from the standpoint of those who must compute dietary values is a table giving vitamin content of many popular prepared cereal foods now on the market A section on food costs gives valuable help in budgeting A summary on the normal diet gives practical information on menu planning, based on the "basic 7" concept of the balanced diet, with sample menus compiled on a cost basis

In the section on nutrition in disease each disease is discussed with reference to its cause pathology, symptoms, laboratory findings, and treatment. The latter includes a discussion on medica-

tions If metabolic changes are of special importance these are discussed at length Recent trends in dietary management, such as higher carbohydrate diets in treating diabetes mellitus and high protein diets in treating peptic ulcers are evaluated Fundamental considerations are outlined and sample menus are given The menus use common household measurements A classification of foods on an exchange basis should be of special practical value in planning diabetic diets

Two special chapters are added one on nutrition in surgery, by Lund and the other on nutrition in industry by Goodhart In the appendix special methods of feeding and the storing and processing of foods as regards vitamin losses are discussed and the different cooking methods are evaluated from the same standpoint Additional tables on food values normal weights and other statistics complete the book One table lists foods accepted by the Council on Foods and Nutrition of the American Medical Association —*Lt H M E Linnenbruegge NC USN*

Tubercul by *Sa l S l mo* M D A oc te Vi ting Phys ia F urth Med al D s Bell vue Ho p tal New Yo k N Y A soc t Cli c l P fe or f M d c New York U er ty P st Grad t Med l S h l 310 p g ill tr ted C ward M C n Inc New Y k N Y p bl h 1952 P $3 50

The author indicates in his introduction that the aim of this small book is to present to the general reader in a convenient and readable form, the current knowledge and recent advances in the subject." He fulfills his objective admirably This instructive book should be required reading for all tuberculosis workers and the many persons concerned in the work of official and volunteer public health agencies Recent advances in treatment and research are well covered and the history of tuberculosis as presented by the author is truly fascinating The up-to-date statistics on the tuberculosis problem in the United States including that of veterans of military service is most informative The section on BCG vaccine is an unusually fair appraisal of this controversial subject The author properly advises hospitalization for the patient with newly discovered tuberculosis but indicates without sufficient explanation that patients with exudative and productive tuberculosis can be cared for at home Unfortunately the review on the classification of lung tuberculosis is subject to misinterpretation by the uninitiated It is stated that patients with exudative tuberculosis do not require streptomycin or other special treatment and that patients with "chronic productive" tuberculosis require no special treatment for the greater part of their illness except for rest during flare-ups In actual practice most new patients with active pulmonary tuberculosis of any type now receive antituberculotic drugs and a definitive program of management based on their

individual needs The diagnosis of exudative (reversible) and caseous pneumonic (irreversible or necrotic) disease is usually determined with certainty only after an extensive period of rest and drug therapy and observance of the response to such a program of management In other words, the diagnosis of various types of tissue response is usually made by hindsight and it is hazardous to withhold special treatment on the basis of a tentative diagnosis Nevertheless this is a fine summary of the present day knowledge of tuberculosis and it is highly recommended for the general reader and the medical library of all hospitals

—*Col C W Tempel, MC, USA*

Handbook of Tropical Dermatology and Medical Mycology Volume 1 edited by *R D G Ph* Simons Amsterdam Senior Lecturer at the Dermatological Clinic of the University of Leyden Dermatologist in Charge at the Civilian Hospital Amsterdam 845 pages illustrated Elsevier Publishing Co New York N Y publishers 1952 Price $15

Volume I, the collected work of about 40 contributors, consists of the following sections (1) General Survey, Dermatology among Children, Pigmentations, Depigmentations, (2) Diseases due to Protozoa, Spirochaetes and Related Conditions, (3) Diseases due to Bacteria, (4) Diseases due to Cocci, (5) Diseases due to Rickettsiae and Viruses, and (6) the Miliary Group of Dermatoses and Tropical Acne Each section is for the most part authoritatively and clearly presented and leaves the reader with an excellent grasp of the subject matter discussed The presentations are modern in their concepts, and to one at all familiar with dermatologic terminology, easily and readily understood Discussion of therapy in each section is brief, to the point, and up to date for the most part

The editor was faced with a tremendous problem in presenting the many contributions in various languages in English There is little overlapping in the various sections, and where overlapping does occur, there are surprisingly few conflicting concepts expressed by the contributors The illustrations are many and excellent

The section on general survey by the editor is made especially entertaining by the author's scholarly, albeit somewhat discursive style his intimate etymologic knowledge, and diverse experience in tropical medicine

This book should be of great value to anyone practicing dermatology in the tropics and also to dermatologists throughout the world because many of the subjects presented are not confined to the tropics The only fault found was the relative frequency of minor typographic errors I am eagerly anticipating the publication of Volume II of this handbook —*Commander V Hall MC USN*

Co g t l A om l e of th H rt and G eat Ve el by *Al A S b the* B S M D F A C P Lt C l A U S Med c l Co s lt t P cific Th t World War II D ector of Med t St V nt Hos p t l Se o Act e St ff T l do Ho p t l d Ma mee \ lley H s p t l Co lt ng St ff St L k s H spit l d T l do St t Ho p al 306 pag ll tr ted Oxford U t ty P s N w York N Y p b l her 1952 P $8

In this monograph there is a short but lucid review of the embryology and morphology of the heart and great vessels and the cause of incidence of and phenomena associated with congenital anomalies in them are discussed The lesions are divided into an acyanotic and a cyanotic group and there is a special section on the complicating conditions associated with these anomalies This book gives precise descriptions of these conditions in a way which is easily understood by the clinician It is well organized well illustrated, and concise The basic principles particularly the developmental anatomy and pathophysiology are stressed This monograph should be useful for the general practitioner internist and pediatrician

—*Commander T D Cuttle MC USN*

Off c P y h try Th Man g me t f the Em lly nd Ment lly D *turbed P t t by Lo G M b M D* As t t Cl l Pro- f sor f Med a d f P ych t y U t ty f Ut h Sch l f M d 310 p ge llust t d Th Y Bo k P bl sh Inc Ch c g Ill p bl h 1952

If we are to consider the vital need of more psychiatric understanding on the part of physicians in general we must give them material such as is contained in this book and which can be used on a practical level Such measures will partially alleviate the increasing demand of the public for psychiatric service Dr Moench presents the basic fundamentals clearly logically and in an easy to-read manner He avoids the theoretical and obscure formulations which in the main would militate against the delving into such proolems by the average busy physician This book should be a useful source of psychiatric information for the busy practitioner One might criticize the naivete of the illustrations which to some degree reduces the dignity of the subject to the comic strip level Their dynamic impact, however is ines capable and they clarify various points in an objective manner

—*Capt T P Rogers MC USN*

B log c l Ch mi try An I trod ctio to B chem try by *Al and G ro* Ph D A iat Profe r f Phamac l gy H h mann M d c l C ll g Ph l d lphia Form ly A s ate Prof o f Ch m try Villa va Colleg V llano P 340 p ge illu trated The Blak to Co I N w Y rk N Y p bl h rs 1952

As the author has stated that this is a textbook or a teaching manual it could not be recommended to physicians or biochemists *for any other purpose Its chief virtue lies in the* liberal use of the most modern concepts of theoretical organic and physical

chemistry applicable to biology and medicine The chief criticism lies in superficiality and a distribution of emphasis that may not meet with general acceptance This or any other attempt to compress fundamental physical chemistry, theoretical organic chemistry, and their application to proteins carbohydrates, and fats into 150 pages liberally diluted with structural formulas could not be otherwise The author has made a very good attempt to reduce the science of chemistry to a "read as you run" basis

—*Lt Col M E Freeman, MCC USA*

Lumbar Disc Lesions Pathogenesis and Treatment of Low Back Pain and Sciatica by *J R Armstrong* M D., M Ch., F R C S., Orthopaedic Surgeon to the Metropolitan Hospital Orthopaedic Surgeon to Lambeth Hospital Visiting Orthopaedic Surgeon to Manor House Hospital (Industrial Orthopaedic Society) Honorary Consulting Orthopaedic Surgeon to Royal Waterloo Hospital for Children and Women, Late Visiting Orthopaedic Surgeon to the Ministry of Pensions Hospital Stoke Mandeville Late Orthopaedic Specialist Royal Air Force Medical Service Foreword by *H Osmond Clarke* C B E F R C S., Orthopaedic Surgeon London Hospital Senior Visiting Surgeon Robert Jones & Agnes Hunt Orthopaedic Hospital Oswestry Civilian Consultant in Orthopaedic Surgery to the Royal Air Force 228 pages illustrated The Williams & Wilkins Co Baltimore Md., publisher 1952

In this monograph on lumbar disk lesions the author has well organized material, drawn from the literature as well as from his own personal experience, and has presented it in an orderly fashion The anatomy, function, and lesions of the lumbar disk are fully described The clinical findings and differential diagnosis are thoroughly discussed The conservative and operative methods of therapy with their complications are described in detail with indications and contraindications for specific types of therapy The author deals with much controversial matter and indicates his own views regarding the pathogenesis of the pathologic processes and methods of therapy

This interesting presentation of a complex subject would be a valuable adjunct in the library of any orthopedic surgeon or other physician who treats patients with back pain

—*Col J W Batch MC USA*

Ophthalmic Pathology An Atlas and Textbook by *Jonas S. Friedenwald Helenor Campbell Wilde A. Edward Maumenee T E Sanders John E. L. Keyes Michael J Hogan W C Owens* and *Ella U Owens* with the editorial assistance of *Helen Knight Steward* Published under the joint sponsorship of *The American Academy of Ophthalmology and Otolaryngology* and *The Armed Forces Institute of Pathology* 489 pages illustrated W B Saunders Co Philadelphia Pa publishers 1952

The revision, or rather replacement, of the old DeCoursey and Ash Atlas brings to us an excellent book This new text is more than an atlas it is a complete text of ocular pa

adequate descriptions of all pathologic states, each accompanied by many well prepared black and white plates The authorship is a compilation of opinions by 8 highly qualified persons The first 2 chapters deal with the normal eye and include plates and descriptions of its physiology and histology The next 2 chapters present the changes associated with advancing age and a detailed description of the mechanics of inflammation A new style is set in that the reference plates are not dispersed throughout the descriptions but follow the bibliography of each chapter on separate pages Subsequent chapters describe ocular lesions in a highly lucid manner A final extensive section on tumors concludes the text The volume is well prepared and the format is pleasing —*Commander D A Mills MC USN*

The 1952 Year Book of General Surgery (Jun 1951 M y 1952) d t d by *Evarts A. G ab m* A B M D Em ritus P fe sor of Surg ry W h i gto U vers ty S hool of Med c ne form ly S tg n n-Ch f of the B s H p tal d of the Ch ldr n Hosp t l St Lou W th a S t n A th ia ed ted by *St a t C. Cull* M D Pr fe s r of S g y nd Ch i m of D s of A th l gy State U iver ity of Iow College f M di i d H spital 670 pag s ill trat d The Y r Book P bl h s Inc Chic go Ill publ h r 1952 Pr e $6.

This Year Book contains abstracts of about 350 articles from domestic and foreign journals which were published during the period from June 1951 through May 1952 The articles are well selected and the abstracts are entirely adequate There is a brief introduction by Dr Graham Most of the numerous illustrations deal with steps in surgical technic Of particular interest are the sections on water and electrolytes and peripheral veins (including thrombophlebitis)

Of particular interest in the portion on anesthesia are the sections on muscle relaxants and local anesthetics

Pertinent, constructive and thought provoking comments by both editors appear throughout the book It is only to be regretted that they are not more numerous —*Col H A Conrad MC USA*

D f th H rt a d A t r A tom c l d F t l D turba c f th Cir ulat T e tme t by *Georg R H rma* M S M D Ph D F A C P P f or f M d ci U ty f T D ec tor f th Ca d c l Se and H art St t U r ity H p t l C lt t V c l D U t d S t s Ma ne H p t l C lt t M d c ne to Surg on Ge l U t d S te Army 4 h d n 652 p ge Illust ted Th C V M by C St L u M p bl h 1952

This new edition is not just a revision of previous editions but is essentially a new text of wider scope and arrangement It comprises 30 chapters and an appendix The arrangement is excellent beginning with the important developmental and structural anatomy of the heart and the physiology of circulation and

progressing to the symptoms and signs of heart disease, relevant laboratory studies, method of study, detailed consideration of clinical features, diagnosis, and treatment of the various types of heart disease A chapter is devoted to peripheral vascular diseases and another to military cardiovascular examinations and interpretations The appendix consists of a condensed summary of important cardiovascular data and an enumeration of common errors in the diagnosis of heart disease A well prepared index is included References of a general nature are cited at the end of each chapter The text is well illustrated

This logically arranged, concise treatise should prove valuable to the undergraduate and postgraduate student and clinician

—Col T W Mattingly MC, USA

Diseases of Metabolism, Detailed Methods of Diagnosis and Treatment edited by *Garfield G Duncan* M D Director of Medical Division Pennsylvania Hospital Clinical Professor of Medicine Jefferson Medical College Philadelphia Pa with 20 contributors 3d edition 1 179 pages illustrated W B Saunders Co Philadelphia Pa publishers 1952

This edition will be welcomed by those familiar with the earlier editions and will undoubtedly make many new friends Eight contributors to the second edition do not appear in the third, but 7 new authors have been added The chapter entitled "Nutritional and Metabolic Aspects of Disorders of the Blood" has been dropped practically in toto, and a new chapter, entitled "Porphyrin Metabolism," has been added A most welcome addition to this edition is an alphabetical author index.

The chapters dealing with (1) carbohydrate metabolism, (2) water balance in health and disease, (3) gout, (4) diabetes mellitus, and (5) diseases of the thyroid have been extensively rewritten The chapter on diabetes mellitus is comprehensive, contains a lucid discussion of the various types of insulin, and follows the "exchange system" of diet prescription advocated by The American Diabetes Association In the chapter on carbohydrate metabolism, Dr Soskin presents his own opinions on certain controversial matters as well as those of other observers The section on porphyrin metabolism is greatly enhanced by an interesting color plate Throughout the book the pertinent American literature through 1951 has been fully incorporated with a smaller number of references to articles published in 1952

Omissions and errors are practically nonexistent Few readers will be misled by the typographic error on page 649 which states that mineral oil may prevent vitamin B absorption The Aub-Dubois standards for the normal BMR are contained in table 3 and not table 5 as erroneously stated on page 5 (but were contained in table 5 in the preceding edition) An otherwise complete chapter on diabetes insipidus fails to mention the hypotonic

saline test It seems unfortunate that the authors of chapters 7 and 19 failed to conform to the practice followed by the others of numbering references so that the source material for specific statements can be clearly and promptly identified

The editor has wisely refrained from eliminating duplication of subject material by different contributors He was faced with the dilemma posed by the artificial and barely discernible separation of metabolism from endocrinology A chapter devoted to the integration of these overlapping fields would be a welcome addition to future editions and would be a logical development of the present introductory chapter

—Lt Col F J Hughes MC USA

Th 1952 Year Book of R d logy (June 1951 J 1952) Radi l g D g s dit d by *F d J nn Hodge* M D P f or d Chairma Dep rt m t of R e tg ology Unt ity of M ch ga a d *J h Fl yd H lt* M D A i t P f sor D p rtment f Roe tge l gy U i r ty f M higa R d tio Th py dit d by *Harold W Ja x* M D P fe sor of Rad l gy Coll g f Phy ic an d Surgeo C l mbi U v ty Chi f R diat on Th rapy D i io Rad log Serv c Pr sbyt an H sp t l N w York N Y a d *V t P Coll* M D P f ssor nd Ch rman D p rtment f Rad logy B ylor U v ty C ll g of M di e R diol g t *n-Ch ef J ff* on Dav If p tal H t T 416 page llustr t d Th Y ar B k Publish I c Ch c g Ill p bl sh 1952 Pr c $7 50

As stated by the editors in the introduction to the diagnostic section their purpose has remained, as in the past to bring to the reader in abstract form the most pertinent and noteworthy ritings on radiology from world literature This they have accomplished to a remarkable degree The larger portion of the volume is again devoted to diagnosis and diagnostic methods with emphasis on common errors in interpretation particularly with the use of contrast media and especially in visualization of the vascular systems in regard to anomalous variations Dan gers and precautions are emphasized Technics are illustrated The section on radiation therapy includes the newer uses of isotopes The latest concepts in the use of supervoltage are discussed Radiation hazards and injuries are reviewed Smaller sections are devoted to physics dosimetry, and radiobiology Statistical reports are skeptically analyzed and the editors pertinent comments placed strategically to stimulate the reader s critical evaluation American radiologic journals are well covered and there is generous coverage of articles of radiologic interest from other specialty fields The foreign literature has been judiciously scanned The volume is well indexed the illustra tions are excellent and the binding is of durable quality

—Col J A Isherwood MC USA

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THE PRINTING OF THIS PUBLICATION HAS BEEN APPROVED THE DIRECTOR OF THE BUREAU OF THE BUDGET, 23 JAN

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Monthly Message

One cannot help viewing with apprehension the present status of career incentive throughout the rank and file of the Armed Forces Numerous articles within recent months have pointed out inherent dangers of this negative trend to the long range security of our national defense One of the newspapers of our Nation s capital dated perhaps significantly on Washington s birthday headlined a news item Seventy five Percent Drop in Re Enlistments Alarms Army and Congress and then added that even the Hard Core of the Service is affected A military professional journal under about the same dateline placed its editorial finger on the basic cause as the progressive deterioration in the attractiveness of the Armed Services as a career When one adds to this already difficult morale situation the necessity for a discriminatory "doctor draft law it is not surprising that reserve medical dental and veterinary officers show little interest in a career in uniform

Appreciating the seriousness of this situation, members of the Armed Forces Medical Policy Council have made every effort both at home and overseas to discuss this problem with doctors in uniform in an effort to determine and if possible correct inequities contributing to a depreciation in career incentive Wherever possible the Council has taken positive action and will continue unceasingly in this important effort

Only a small minority of the grass roots informants discussing career interests complain of the lack of professional challenge in the service Most of those with whom this subject was discussed were deeply grateful for the opportunity for professional advancement made available in military hospitals and research centers One of the most constant and serious criticisms heard is that of the uncertainty of a future in uniform In view of the gradual but none the less certain deprivation of the rights and privileges of service personnel, one is hard put to dispel this atmosphere of future uncertainty

We as a nation cannot afford to forget that the stabilization of a hard core" of career doctors in the Armed Forces is essential to our security and every effort both within and without the Department of Defense must be made to improve the present seriously low status of career incentive

Melvin A Casberg M D *Chairman*
Armed Forces Medical Policy Council
Office of the Secretary of Defense

HE SURGICAL MANAGEMENT OF BRONCHIECTASIS[1]

view Based on the Analysis of 100 Consecutive Resections

CLIFFORD F STOREY *Captain MC USN*

EUGENE G LAFORET *Lieutenant MC USNR*

ONCHIECTASIS is second in frequency only to pulmonary tuberculosis among the chronic pulmonary diseases The fact that it is commonly encountered in otherwise healthy adults makes it a condition of great economic and military ance The excellent therapeutic results that can be achieved gery emphasize the need for an accurate diagnosis and ade treatment Bronchiectasis can be cured only by resection diseased segments of lung, and a well planned and skill executed surgical program usually assures a satisfying clini sult Service personnel who have undergone successful re n ordinarily can be returned to active military duty

constantly improving postoperative results and the marked ion in operative mortality and in morbidity following ex which have occurred within recent years account for the ant position which surgical treatment has assumed Refine of diagnostic, surgical, and anesthetic technics have played nent roles in bringing this mode of therapy to the forefront tive management is not yet a standardized procedure appli to all patients, however, and differences of opinion still relative to such fundamental questions as the selection of nts for operation, the extent of resection, and the details stoperative care

HISTORICAL REVIEW

e story of the development of the modern surgical treatment onchiectasis provides a fascinating chapter in the history oracic surgery Although the first successful partial lobec- was performed by Roland) in 1499, resection of a lobe e lung *bronchiectas* not carried out with success the op n performed nh *(3)* in 1901 As recent-

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A major contribution of the Division in collaboration with a task group sponsored by the Munitions Board Office of the Secretary of Defense, has been the development of uniform basic construction plans for military hospitals to be used by the Army Navy and Air Force The designs are for both temporary and permanent construction All sizes and types of hospitals have incorporated into their initial chassis basic facilities which will permit a 100 percent expansion in bed capacity by the construction of additional wards only

Close liaison is maintained by the Division with the Central Intelligence Agency and with the medical officers assigned to the intelligence services of the Army Navy and Air Force coordinating such activities as may be required by the Council

This Division maintains continuing liaison and coordination on matters relating to the medical and health fields with the Joint Chiefs of Staff, the Munitions Board and other Department of Defense agencies In this category are policy problems relating to mobilization reserves of medical materiel the Armed Services Medical Procurement Agency and the Armed Services Medical Regulating Office

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BOOKS RECEIVED

F d me tal of Cl c l Orthopedics by *P ter A. Cas grand* M. D Orthc ped Department of Buffalo Ge al Hosp tal Buff lo Childre Hos p l and the Un ty of Buff lo Med al School Att nding Orto ped t t be Chron c D s R arch Inst tute of the U sity o Buf lo nd be Vet ra s A mi tration H p tal Buf l N Y n. H W Frost Jr M. D Orthoped Department of Buff l Ger Hosp l and The Un ve s ty of Buf l Med cal School Buf l N F ewerous b Jos S Barr M. D. and Fr k N P tt M. D. e Illustr re Grune & Stratton Inc N Y pu li her 19[illegible] $

T Ba Nemrol er The Ana omy and Phys l gy of the Nervou The Anel t on t Clinical Nemrology by *Samuel Brok* N r t Neu er Colleee of Med ine N w York Univers N Illustra ed The W lliams & W lkins Co Bal P ce $"

D d t he t e Anatomi l and Femor oral Distri utions of the C a e George F Herrmann M. S. D. Ph. D. F A t Ne l me University of T xas Director of the Ca e a Heart Sta on University Hospital's Co Lou e State Marine Hospital Consul Me e eneral Lou e State ity Ath e pare l s C N Mosby Co St Lou Mo [illegible] Ill Pri $

ficial pneumothorax for those patients with bronchiectasis having a free pleural space Whittemore and Balboni *(15)* collected reports of 93 patients so treated, of whom only 14 were reported as cured They concluded that pneumothorax could not be considered a curative measure in bronchiectasis

Körte *(16)* reported 3 patients with bronchiectasis treated by thoracoplasty This operation was used for a number of years and was popularized in this country by Hedblom *(17)* who described 18 patients treated by thoracoplasty with no early deaths and marked improvement in most cases He suggested that the thoracoplasty be performed in stages Despite favorable early results in some cases, improvement following thoracoplasty was often temporary, and patients so treated continued to die of their disease Plombage with paraffin, fat, and omentum were tried with disappointing results *(18)* Phrenicectomy enjoyed a wave of popularity as a therapeutic measure between 1920 and 1930 *(19-22)* but in 1935 Graham et al *(23)* collected 82 cases treated by this method alone without definite beneficial results

Occasional patients with bronchiectasis were treated by lobectomy following Heidenhain's successful operation in 1901 By 1923, Graham *(24)* was able to collect reports of 48 such patients, of whom 25 died and in only 8 of whom was the therapy considered a success These unfavorable results caused him *(25)* to advocate cautery pneumonectomy In 1927 he *(26)* reported 45 patients with various types of suppurative pulmonary disease in

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(15) Whittemore W and Balboni G M Pulmonary tuberculosis bronchopulmonary suppuration Its treatment by artificial pneumothorax Arch Surg 16 228-278 Jan (pt 2) 1928.

(16) Körte W Erfahrungen über Operationen wegen Lungenerkrankung und Gangrän Arch f klin Chir 85 1 62 1908

(17) Hedblom C A Extrapleural thoracoplasty in treatment of bronchiectasis Surg Gynec & Obst 38 74 752 Jun 1924

(18) Meyer W On bronchiectasis Ann Surg 60 7 1914

(19) Brauer L Die Kollapstherapie der Bronchektasen Tuberk Med Monatsschr 2 443-449 July 1920

(20) McGregor A L Surgery of bronchiectasis J M A S Africa 1 141 143 Oct 26 1926

(21) Hartzell S W Phrenic nerve crushing for relief of bronchiectasis Proc Staff Meet Mayo Clin 3 98 Mar 21 1928

(22) Davis H M Endeavor to assess value of phrenic diaphragmatic paralysis by evidence of phrenic nerve operation in treatment of pulmonary tuberculosis and bronchiectasis review of 105 cases Tubercle 9 205-210 Feb 1928.

(23) Graham E A Singer J J and Ball H C Surgical Diseases of the Chest Lea & Febiger Philadelphia Pa 1935

(24) Graham E A Surgical treatment of bronchiectasis with report of 3 cases of removal of lobe of lung Arch Surg 6 3 1336 (pt 2) June 1923

(25) Graham E A Cautery pneumonectomy for chronic suppuration of lung report of 20 cases Arch Surg 10 392 418 (pt 1) Jan 1925

(26) Graham E A Treatment of pulmonary suppuration Trans Am Surg Assn 45 206-209 1927 Ann Surg 86 174-181 Aug 1927

whom the cautery technic had been applied The mortality in this series totaled 17 8 percent and 69 percent of the patients were symptom free at the time of his report.

The modern era in the surgical treatment of bronchiectasis began in 1929 when Brunn *(27)* reported 6 one-stage lobectomies with 1 death The operation had previously been carried out in 2 or more stages *(28)* The primary stage of the multiple stage procedure was designed to promote obliteration of the pleural space so that total empyema would not follow the resection and so that physiologic disturbances resulting from an open chest would be minimized Clamps or mass ligatures were applied to the hilar structures at the time of lobectomy The tourniquet technic was introduced by Shenstone and Janes *(29)* The first total pneumonectomy for bronchiectasis was performed by Nissen *(30)* in Germany in 1931 The second such operation and the first in this country was done by Haight *(31)* in 1932 Dolley and Jones *(4 5)* collected 46 cases of bronchiectasis treated by pneumonectomy The operative mortality was 37 percent and only 39 percent of the patients were considered cured

The latest great advance in the surgical therapy of bronchiectasis consisted in the introduction by Churchill and Belsey *(32)* in 1932 of the technic of segmental resection The widespread adoption of the policy of limiting the resection to those segments known to be involved and universal employment of the individual hilar dissection and ligation technic have resulted in resection for bronchiectasis becoming one of the safest and most satisfactory of all major surgical procedures as shown by the report of Kay et al *(33)* who performed resections on 184 patients with bronchiectasis only 1 of whom died

MEDICAL MANAGEMENT

Almost universally internists, aware of the strict limitations of nonsurgical treatment in bronchiectasis have been among the

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(27) P l r Surg l pr pl nd ly g ne g l be t my J h Surg 18 490-515 J (pt 2) 1929

(28) Al n J (A Arbo M h Jr T tal pulm na y l be t my s mpl nd tf two- tag h rque Surg Cyne & Ob t 56 658-673 Ma 1933

(29) Shens ne S nd J ne R h E pe pe pulm nary l be my Canad M A J 27 138-145 Aug 1932

(30) N R Ex pa ne ganz L g flug l Z Ibl f Ch 58 3003-3006 N 21 1931

(31) Laigh C T l ov l f l f lung for be nch urg Gyne & Ob t 58 776-780 Apr 1934

(32) Chur h ll E r nd Bel y R Segme l pne m my br h ta is l g l gme t f l f pr l be A Surg 109 481 499 Ap 1939

(33) Kay E B. We R H J nd l gh J A J Surg l me f bronch ta A I N d 6 1 12 J 1947

most ardent proponents of resection *(34 36)* Robinson *(37)* stated "Advanced bronchiectasis cannot be cured by medications, inhalations, intratracheal injections, intratracheal irrigations, climatotherapy or vaccines" The present results of medical management, even with the newer antibiotics, do not appear sufficiently gratifying to present a serious challenge to resection therapy, although adequate statistics on this point are not yet available The classic survey of Perry and King *(38)* indicated the poor prognosis of patients treated medically King *(39)* recently commented on the apparent reduction in the number of patients with the severe saccular bronchiectasis on which their report was based He therefore emphasized the need for caution in treating surgically those patients who show "a maximal bronchographic extent of otherwise minimal disease" Chamberlain *(40)* has also mentioned a recent reduction in the numoer of patients seen with well developed bronchiectasis for which resection is indicated, and Clagett *(41 43)* has noted a progressive decline in the number of resections performed for bronchiectasis, while the incidence for other causes has continued to rise

This apparent trend may possibly oe due to improved results in the conservative management of already fully developed cases, but it probably mirrors instead a tendency towards satisfactory prevention by more efficient medical therapy of those disorders of which bronchiectasis is a common sequela The availability of potent antibiotics has resulted in a sharp reduction in the incidence of bronchopneumonia and other acute pulmonary infections which are common precursors of bronchiectasis

In spite of the potentialities of conservative management for preserving the status quo of many bronchiectatic patients, no

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(34) Riggins H M Present concepts of pathogenesis morbidity mortality and treatment of bronchiectasis Dis Chest 9 5-23 Jan Feb 1943

(35) Badger T L Bronchiectasis treatment and prevention New England J Med 237 93 941 Dec 18 1947

(36) Perry J M A and King D S Bronchiectasis study of prognosis based on follow up of 400 patients Am Rev Tuberc 41 531 548 May 1940

(37) Robinson S Surgery of bronchiectasis Surg Gynec & Obst 24 194 1917

(38) Perry J M A and King D S Bronchiectasis study of prognosis based on follow up of 400 patients Am Rev Tuberc 41 531 548 May 1940 Cited in Scannell J G Medical Progress Thoracic surgery New England J Med 239 961 967 Dec 16 1948

(39) King D S Personal communication to Scannell Cited in Scannell J G Medical Progress Thoracic surgery New England J Med 239 961 967 Dec 16 1948

(40) Chamberlain J M Personal communication

(41) Clagett O T Personal communication

(42) Clagett O T Indications for pulmonary resection Kansas City M J 26 4 1950

(43) Clagett O T Indications for pulmonary resection Australian & New Zealand J Surg 0 165-183 Feb 1951

alterations in the irreversible lesions of the disease can reasonably be expected and extirpation continues to afford the only curative approach *(35 44 46)* Medical management nevertheless has contributed greatly to the comfort of those patients for whom resection is contraindicated or to whom because of the extent of the disease or other considerations a complete surgical program cannot be offered *(47)* It has also made definitive operation possible in many patients who otherwise would not be suitable for excision

An adequate medical regimen constitutes an indispensable component of the routine preoperative preparation of surgical candidates It is directed toward mechanical drainage control of infection and improvement of the general health *(35)* Effective postural drainage rigidly supervised and carried out at frequent intervals (6 to 8 times daily) has been of paramount importance The most effective posture depends somewhat on the location of the disease but even for similar locations it may vary from patient to patient It is customary to have the patient lie across a bed so that his hands are on the floor and his trunk inverted while he coughs and raises his secretions Patients with middle lobe disease however, are frequently better able to do this when lying supine Others find the lateral decubitus position with the diseased side uppermost, most favorable The latter positions are most effective if the bed is placed in a rather steep Trendelenburg position Each patient should be encouraged to experiment and to use that position which works best for him He should not be instructed to carry out postural drainage for a given number of minutes but rather to persist in his efforts until secretions can no longer be raised

Use is made of the antibiotics particularly penicillin after culturing the sputum for predominating organisms and testing them for sensitivity Occasionally streptomycin or one of the kindred drugs will be found to be the treatment of choice In patients for whom resection is not contemplated it is particularly important to employ antibiotics only on definite indications and for brief periods in order to minimize development of resistance These patients who must live with their bronchiectasis should exercise unusual diligence to avoid colds and exposure to the elements occasionally a change of climate is advisable This group of bronchiectatics should maintain an optimum dietary regimen

(44) Och ne A DeBak y M nd DeCamp P T Br h t ur re by p lm ca y nalys of 96 Surg y 25 518-532 Apr 1949
(45) Alla W B r h mod e me So h M J 41 1049-1052 Nov 1948
(46) Lind k g C L nd All y R D Bla I br h cta naly f 43 c s t ve A h Surg 60 465-472 Sa 1950
(47) Al nd r J I l f med re nd surg y l manag me t f b h t s A Int Med 21 565- 9 Oc 1 44

with due attention to vitamins and minerals as well as to caloric intake Periodic therapeutic bronchoscopy not infrequently affords them beneficial results

CLINICAL MATERIAL

With a view to indicating certain of the persisting problems entailed in the surgical management of bronchiectasis, a review was made of all patients who underwent operation for this disease on the thoracic surgical service in this hospital between June 1947 and June 1952 A total of 100 resections performed on 92 patients during that period constitutes the basis of this report Certain of the earlier cases in this series have been discussed from general aspects in a previous article *(48)* Military personnel on active duty constituted the majority of patients here reported Consequently the series is composed chiefly of young men, although some veterans, retired personnel, and dependents were included There were 85 men and 7 women, the average age of the men being 29 7 and of the women, 31 years The youngest patient subjected to surgery was 17 years of age and the oldest 67 The known duration of disease prior to operation ranged from 1 week to 21 years (average 3 6 years) In many instances the probable duration far exceeded the known duration and frequently extended to childhood

SYMPTOMS

Classically, a chronic cough productive of purulent sputum has been considered the most representative symptom of bronchiectasis This was present in 95 percent of the patients here reported The daily sputum production ranged from 5 to 250 cc Hemoptysis, varying from slight streaking of the sputum to massive bleeding, had occurred at least once in 44 percent of the patients Chest pain, recurrent pneumonic episodes, dyspnea, and constitutional manifestations of chronic sepsis were significant elements in many instances Rarely a completely asymptomatic process was discovered when a routine roentgenogram of the chest suggested the necessity of bronchography The reverse situation is far more common in that a standard film might appear quite normal in a patient with severe symptoms and serious bronchiectasis In 1 patient, the only outstanding subjective or objective finding prior to bronchography was the presence of unexplained localized basal pulmonary rales on routine physical examination

BACTERIOLOGY

Little emphasis has been placed on preoperative bacteriologic studies of the sputum because of the paucity of useful information

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Figure 1 There is a large tuberculous cavity in the superior segment of the left lower lobe The patient was treated by temporary phrenic paralysis and the cavity closed Figure 2 Right anterior oblique bronchogram showing contracted lower lobe of left lung and bronchiectasis

A tuberculous cause was demonstrated in 2 patients, 1 with sac cular bronchiectasis of all segments of the right upper lobe and the other with total involvement of the left lower lobe (fig 1) In the latter patient the cavity closed following a temporary phrenic nerve paralysis Bronchograms (figs 2 and 3) were obtained because he continued to cough and raise purulent sputum which was consistently negative for acid fast bacilli An ex cellent clinical result was obtained following lobectomy In 9



F gur 3 Left lateral br nchogr m bow g the cyl nd at br nch tas s vol g all gm t of the left low lobe

patients an intrapulmonary metallic foreign body was undoubtedly he sole etiologic factor One patient was known to have aspirated t tooth as a child A history of a difficult dental extraction was elicited as the only potential cause in another patient An intra bronchial foreign body was a possible etiologic agent in a patient who had inhaled a peanut hull at the age of 18 months with subsequent productive cough which had persisted to the time of opera tion 19 years later Examination of the resected lobe however failed to disclose the presence of the foreign body Only 1 pa tient with bronchiectasis secondary to benign or malignant intra bronchial neoplasm is included in the present series (although

associated bronchiectatic changes were often found in patients who underwent resection for pulmonary malignancy) She was a 37 year old woman who had had a chronic cough with purulent sputum, recurrent bouts of pneumonitis, and occasional small pulmonary hemorrhages in the 5 years preceding operation bronchoscopy revealed the presence of an adenoma of the proximal portion of the lower lobe bronchus near the middle lobe orifice There was partial obstruction and severe bronchiectasis of the middle and lower lobe bronchi

DEFINITIVE DIAGNOSIS

Although the presence of bronchiectasis may be inferred from a critical evaluation of the history, physical findings, and standard roentgenograms of the chest, bronchography is necessary for a definitive diagnosis Not merely the existence of bronchiectasis, but also its extent and, of lesser import, its type, should be determined With others *(33, 44 45 50-52)* we believe that complete mapping of the tracheobronchial tree is a preoperative requisite Intelligent planning of the surgical program demands an accurate knowledge of the presence or absence of bronchiectatic changes in all lobes of both lungs, and incomplete bronchography cannot be expected to afford such information

Many instances of unsatisfactory response to resection have probably resulted from a failure to appreciate the necessity of obtaining complete delineation of the bronchial tree prior to operation In one of the patients seen early in this series, persistence of symptoms postoperatively prompted a more intensive bronchographic examination This revealed the presence of extensive residual bronchiectasis in an area which was totally unsuspected preoperatively, not having been adequately visualized in the preoperative bronchograms A second operation on the same side was necessary to effect complete symptomatic relief Such unfavorable results are a constant threat if the absence of bronchiectasis in any lobe or segment is assumed without bronchographic confirmation In 1 patient in this series, it was necessary to obtain 4 sets of bronchograms before satisfactory visualization of all bronchopulmonary segments was achieved The complete distribution of the disease must be known before surgical intervention is considered

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(50) Carr D Skinner E F Denman W E nd Kessle C. R Physiological significance of bronchiectasis D s Chest 16 137 145 Aug 1949

(51) Soule C. R Bronchiectasis and its management report of 277 cases Dis Chest 16 381 407 Oct 1949

(52) Paterson J F and Crassweller P O Lobectomy for bronchiectasis s me ea ons for it failure to satisfy all patients Bull Acad Med Toronto 22 223-231 Apr 1949

Figure 4. Lateral roentgenogram of the chest showing localized atelectasis and pneumonitis of the left lower lobe.

Figure 5. Right anterior oblique roentgenogram of the chest showing a large bullous emphysematous lesion of the left upper lobe. The

Figure 6 Bronchogram showing serious bronchiectasis in the upper as well as the lower lobe. *Figure 7* Lateral view showing bronchiectasis in the posterior segment of the upper lobe as well as severe middle lobe involvement

An example of localized unilobar disease is shown in figures 4 and 5 The right bronchogram (not shown) of this patient was negative On the posteroanterior bronchogram alone involvement of the lingula might be assumed The bronchograms of another patient (figs 6 and 7) demonstrate the necessity for complete mapping of the entire bronchial tree In this patient a poor result would have followed resection of the middle lobe only Figure 8



Figure 8. In this bronchogram the atelectatic middle lobe is clearly outlined The middle lobe bronchi do not fill well giving the dilated appearance and cylindrically dilated The remainder of the lung field is clear

illustrates the usual findings in a patient with middle lobe syndrome A good result is virtually certain to follow excision in a patient with disease of this distribution The exact segments which were involved in the patient whose bronchograms are shown in figures 9 and 10 could be determined only in the oblique and lateral views The site of the disease in this patient is unusual for a nontuberculous bronchiectasis Neglecting to fill the upper lobes would have failed to demonstrate some or all of the disease Figure 11 illustrates a common pattern of bilateral disease Although all diseased segments *(9)* on both sides were removed (fig 12) the patient's postoperative functional status was good

Figure 9 Posteroanterior bilateral bronchogram showing severe saccular bronchiectasis in the upper half of the left lung Figure 10 Bronchogram showing a bronchiectatic abscess of the lingula and severe cystic bronchiectasis of the apicoposterior segment of the upper lobe of the left lung

Figure 11. Panoramic tomogram of the mandible and both temporomandibular joints. Note the mandibular condyles and both coronoid processes of the lower jaw. Figure 12. Bilateral transpharyngeal tomogram of the mandible and both temporomandibular joints. The ghost image of the mandible is well visualized above the

Much has been written concerning the development of new disease in the early postoperative period *(44, 52, 53)* Although bronchiectasis is not considered a progressive disease in the usual sense, progression can undoubtedly occur In order to evaluate such instances, however, adequate baseline bronchograms are necessary prior to operation Otherwise it cannot be determined whether the changes were present but undiagnosed preoperatively, or whether they represent newly acquired lesions Figure 13 shows the preoperative bronchogram of a patient with advanced cylindrical bronchiectasis of the basal segments of the right lower lobe The normal superior segment shown in the postoperative bronchogram (fig 14) was worth preserving The postoperative course of another patient, whose bronchograms are shown in figures 15 and 16, was complicated

Because of the frequently confusing findings presented by retained intrapulmonary contrast medium, every effort is made to obtain satisfactory bronchograms on the initial attempt Prior to bronchography, a decrease in secretions is effected by antibiotic therapy postural drainage carried out several times daily, and preliminary bronchoscopy Hypodermic injections of 65 mg of codeine sulfate and 0 4 mg of atropine sulfate and the oral administration of 0 1 gram of pentobarbital sodium are used prior to bronchography Anesthesia is obtained with topical pontocaine hydrochloride solution (2 percent to spray the oropharynx and by applicator in each pyriform sinus, and 1 percent by instillation in the larynx, trachea and bronchi) Through a transoral, intratracheal 16 Fr rubber urethral catheter, under direct fluoroscopic visualization, radiopaque oil is first introduced into the bronchial tree of the lung clinically considered as probably the seat of the most extensive involvement Satisfactory positioning of the subject is accomplished using essentially the technic described by Schmidt *(54)* Stereoscopic posteroanterior and appropriate oblique views, as well as a single lateral view of the side filled first, are taken A similar procedure is followed on the second side, with omission of the lateral projection because it would have no value when both lungs contain contrast medium Excellent delineation of the entire tracheobronchial tree is usually achieved at one sitting Should the results be unsatisfactory, excision is deferred until fully satisfactory bronchograms have been obtained This is commonly but a minor problem, involving improved filling of one or several adjacent segmental bronchi which were not well delineated on the original bronchograms, but some delay is entailed in awaiting expulsion of the original radiopaque material

(53) [illegible] F G Surgical treatment of bilateral bronchiectasis J Thoracic Surg 19 25 65 Feb 1950

(54) Schmidt H W (Roche re Minn) Method of obtaining bilateral bronchograms Proc Staff Meet Mayo Clin 23 71 77 Feb 4 1948

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Figure 15 Right anterior oblique bronchogram showing cylindrical bronchiectasis of all basal segments of the left lower lobe with a normal superior segment Figure 16 Right anterior oblique view made following resection of the left basal segments The ectatic superior segment can be faintly seen overlying the heart shadow It shows definite cylindrical bronchiectasis of all divisions

Although not comparable to roentgen contrast studies in outlining the distribution of the disease bronchoscopy frequently furnishes important information which may be obtained in no other manner Occasionally the results may be entirely within normal limits furnishing significant negative data Localized mucosal hyperemia, abnormal secretions or both are often the only indication of a more distal disease process Such etiologic factors as a foreign body or a tumor may be disclosed, thus dictating alterations in the proposed operative management. In patients with bilateral bronchiectasis in whom the bronchographic extent of disease is about equal in the 2 lungs bronchoscopy may be a decisive factor in indicating the side of initial surgical attack The lung giving rise to the greater amount of secretions is favored for primary operation in such cases At times patients with minimal bilateral bronchiectasis and in whom recurrent severe hemoptysis invalidates an otherwise satisfactory conservative regimen are encountered Bronchoscopy may be indispensable in such instances in determining the side of the bleeding and hence the side for resection

Whenever possible endoscopy should precede the initial bronchography in order to facilitate satisfactory filling of the tracheobronchial tree by aspiration of retained secretions This sequence has been followed in most of the patients included in this report It is usually not feasible to carry out bronchoscopy and bronchography on the same day, but bronchograms are obtained as soon after bronchoscopy as practicable In young children who require general anesthesia for broncho copy, the 2 procedures are carried out in succession under the same anesthetic

Although some *(51)* are of the opinion that preoperative bronchoscopy may safely be dispensed with provided bronchograms have been successful and no lobe or segment is obstructed we agree with Woodward and White *(55)* that bronchoscopy should be employed in *all* patients with bronchiectasis as a routine examination and hold that its use is mandatory in all patients in whom resection is contemplated

PREOPERATIVE REGIMEN

Surgery in bronchiectasis is elective in nature and once the decision for resection has been made an additional period of intensive preoperative preparation may be necessary in order that the operation be undertaken under the most favorable condition possible *(56)* General measures such as appropriate diet vitamin

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(55) Woodw d F D nd Wh M L J U f br ch py br nch D Che t 16 94 99 J ly 1949

(56) Boy F F P nc pl nd pr l be t my (nclud ng segmen l) nd tot l pne m ne omy for br nch c i nd hr J g b D Che 17 206-225 F b 1950

therapy, and the study and treatment of concomitant cardiovascular, hepatic, renal, or other coexisting disease are used. Preoperative blood transfusions are indicated fairly often. Effort is made to assure a nearly normal circulating blood volume prior to operation.

The special treatment afforded patients being prepared for excision closely parallels that suggested for the medical management of bronchiectatic patients. Postural drainage is instituted in those in whom the amount of sputum is significant. Penicillin intramuscularly and by aerosol *(37)* or intrabronchially is given routinely. This usually effects a pronounced reduction in the amount and viscosity of the sputum. Streptomycin or a related agent is sometimes used in similar fashion, but only on definite indication. Therapeutic bronchoscopy with aspiration may be advisable and in some patients is done repeatedly.

Examination of the ears, nose, throat, and teeth constitutes a part of the routine preoperative work up, and indicated therapy is instituted. Special care is paid to removing badly carious teeth and treating any sinus disease.

To minimize the possibility of a postoperative pneumonitis due to retained iodized oil, Nav et al *(33)* advocated delaying the operation until about 5 weeks after the most recent bronchogram. We have done this in most of our patients, but several who showed a large amount of residual oil on films or fluoroscopy immediately before operation have developed no postoperative complications attributable to its presence. We believe that the elimination of the radiopaque medium is desirable, not because of the possibility of pneumonitis, but because its presence may interfere with satisfactory interpretation of the roentgenograms of the chest in the immediate postoperative period. The physiologic harmlessness of retained lipiodol has been confirmed by the clinical experiments of Black and Roos *(38)* who concluded that "the fear of impaired transalveolar diffusion should not delay an intrapleural operation more than a few days after bronchography." Within the past year, excision has not been delayed in any of our patients merely because of recent bronchograms or retained lipiodol, and has often followed bronchography within less than 1 week. No complications ascribable to this practice have been demonstrated.

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(37) Ol... A... nebulizat... therapy in bronchiectasis: use of penicillin and streptomycin aerosols. J. A. M. A. 134: 947–953, July 19, 1947.

(38) Black, H., and Roos, A.: Effect of lipiodol on alveolar gas exchange: preliminary report. In Surgical Forum, Proceedings of the Forum Sessions, Thirty-sixth Clinical Congress of the American College of Surgeons, Boston, Mass., October 1950. W. B. Saunders Co., Phila., Philadelphia, Pa., 1951, p. 13-1.

KEY
PNEUMONECTOMY
UNILATERAL SUBTOTAL RESECTION RIGHT
3 CASES
1 CASE
3 CASES
2 CASES
1 CASE
1 CASE
1 CASE
3 CASES
2 CASES
1 CASE
1 CASE
3 CASES

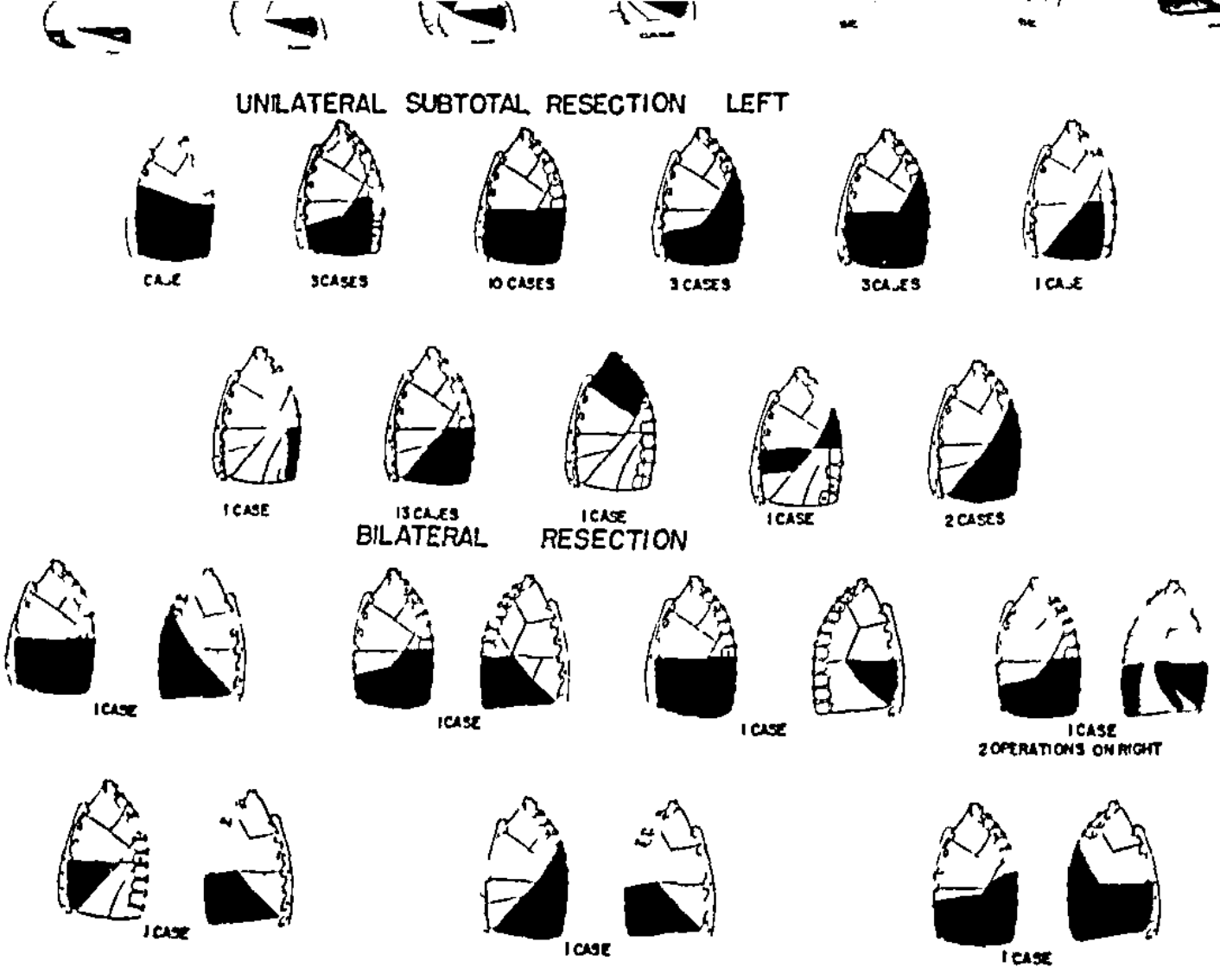


Figure 17 Schematic representation of the extent and distribution of resections in 92 patients

Studies of pulmonary function may be necessary in patients whose respiratory reserve is clinically dubious Present techniques permit a fairly precise estimation of a patient's pulmonary functional status, and such information will carry a decisive weight for or against operation in a borderline case We have recently instituted a program of carrying out studies of pre- and post operative function on all patients who undergo resection for bronchiectasis

EXTENT AND DISTRIBUTION OF RESECTIONS

Figure 17 shows an analysis of the primary surgical procedures constituting the basis of this report The most frequently resected areas were the lingula of the left upper lobe the right middle lobe and the basal segments of the lower lobe of both lungs This is in agreement with the universally accepted distribution of bronchiectasis Seven pneumonectomies were performed 6 for severe total unilateral bronchiectasis without significant contralateral disease and 1 because of technical difficulties which rendered a lesser resection unfeasible There were 11 patients with "right middle lobe syndrome all treated by lobectomy In addition 1 right middle lobectomy was performed for bronchiectasis secondary to the implantation of a shell fragment and 1 because of an adjacent bronchial adenoma The patients with bilateral resection exemplified the classic pattern of the disease when significantly affecting both lungs Bronchograms of one of these are shown (figs 18 and 19) Seven patients with unilateral resection were awaiting a second operation for contralateral disease at the time of writing The superior segment of the lower lobe was preserved in 46 instances in which resection of all the basal segments of the corresponding lobe *was performed (figs 13 and 14)*

Resection of the entire lower lobe both segments of the lingula and the inferior subsegment of the anterior segment of the left upper lobe was the most extensive operation on a single side short of total pneumonectomy The diseased segments were greatly *contracted and compensatory distention of the healthy se*ments was found to have already taken place at the time of operation Although only 11 of the original 8 bronchopulmonary segments were preserved on the left side in this patient, they filled the left hemithorax adequately (fig 20) This ultraconservative program was elected in lieu of left pneumonectomy because it is possible that this patient will require excision on the right side in the future His postoperative functional status has been found to be satisfactory

We have not hesitated to remove subsegments while preserving the undiseased portions of the segment when conservation of all possible healthy portions of lung appeared to be highly desirable

Figure 18 Bilateral bronchogram showing involvement of the entire middle and lower lobes of the right lung and of the lingula and lower lobe of the left lung. *Figure 19* Left anterior oblique bronchogram made following the removal of the lower and middle lobe of both lungs. Note how well the healthy upper lobe fills the right hemithorax

Bronchograms which clearly delineate all diseased areas a knowledge of the bronchovascular anatomy of all segments of both lungs and dissection carried out with painstaking care make subsegmental resections surgically feasible Thus in 1 patient, whose totally bronchiectatic right middle and lower lobes were removed at the first operation the basal divisions of the left



Figure 20. Roentgenogram showing the residual pulmonary tissue fully filling the hemithorax of a patient from whom all segments of the left lung except the apicoposterior and a portion of the anterior segment of the upper lobe have been removed

lower lobe, the inferior suosegment of the superior segment of the left lower lobe and the inferior subsegment of the superior segment of the lingula were removed at operation on the left side His postoperative course was without significant complications and although he now has only 5 11/12 of his original 18 bronchopulmonary segments (fig 21) his pulmonary function is adequate

In spite of our desire to conserve all healthy lung we are reluctant to split the basal segments It is usually preferable to remove all of the basal segments if one or more of them are involved When some of the basal segments are excised and one or more are left behind they do not always "fit the pleural space well and there is a tendency to distortion as the residual lung re-expands Because precise identification of the various basal

segmental bronchi is not always possible, there is the hazard of leaving the diseased segment behind and removing a healthy one The mistake in identification of a basal bronchus may occur during the evaluation of the preoperative bronchograms or at the time of operation In either event the result is distressing The arteries and veins of the segments to be retained cannot invariably be avoided with ease and the location of the inferior pulmonary vein



Figure 21 Posteroanterior roentgenogram of the chest of a patient from whom slightly more than 12 bronchopulmonary segments have been resected This patient's preoperative bronchograms are shown in figures 18 and 19 Residual lipiodol is seen in the right lower lung

impedes dissection Our limited experience with removing only a portion of the basal segments leads us to believe that pleural complications are greater when this is done even though it has been possible to perform a resection which was technically satisfactory For these reasons we divide the basal segments only when there appear to be compelling reasons for doing so

SELECTION OF PATIENTS

There are no all inclusive unerring criteria whereby those patients who will be greatly benefited by resection may be selected, but the more localized the disease the better the expectation of complete extirpation with a curative or greatly beneficial result Age per se is not considered a barrier Although this series includes no young children it has been well established

that the very young withstand major intrathoracic surgery amaz ingly well whereas untreated bronchiectasis which has its inception in infancy or early childhood carries the highest eventual mortality rate In older patients, concomitant cardiovascular or other degenerative diseases that would contraindicate a major elective operation of any nature would be deterrents to resection for bronchiectasis without necessarily precluding it

Perhaps the most controversial problem in the selection of surgical candidates revolves around those patients with minimal localized disease The bronchographic extent of disease does not always parallel the symptomatology One patient had severe symp toms suggestive of bronchiectasis on the right side Bronchos copy showed profuse purulent secretions from the right middle lobe and basal divisions of the right lower lobe Bronchoscopy and bronchography showed a normal left lung The patient had several bouts of pneumonitis on the right side and numerous episodes of hemoptysis The right middle lobe and basal seg ments of the right lower lobe were resected and the clinical result was excellent The patient presented an excellent ex ample of marked symptoms with minimal bronchographic evidence of bronchiectasis (figs 22 and 23) A patient with distinct localized bronchiectasis even though it may be of minimal ex tent who experiences hemoptysis or other serious manifesta tions should be considered for excision The more severe the symptoms, the more advisable is resection In bronchiectatic patients with few or no symptoms the immediate risk of thoracot omy must be weighed against the long term risk inherent even in asymptomatic localized bronchiectasis Resection has usually been excluded in such patients either by the patient or the surgeon These patients nevertheless warrant vigilant scrutiny and the appearance of symptoms ascribable to bronchiectasis should signalize reconsideration of operation

The problem of asymptomatic bronchiectasis involving an entire lobe or more is somewhat different because the passage of time will inevitably bring the onset of symptoms and resection is indicated in such patients Reference has been made to one such patient a 24 year-old man who was found on examination for re-enlistment to have constant unexplained pulmonary rale on the right side Apart from the occurrence of pneumonia at the age of 6 years, his respiratory history was not significant Stand- ard chest roentgenograms were negative but bronchography dis closed bronchiectasis of the right middle lobe and basal segments of the right lower lobe The patient underwent right middle and lower lobectomy and gross and histologic study of the resected specimen confirmed the bronchographic findings The postopera tive course was uneventful It is believed that in this patie t operation prevented the development of serious pulmonary symp toms





Figure 2 Posteroanterior right bronchogram which might easily be interpreted as normal Figure 23 Right lateral bronchogram showing mild cylindrical bronchiectasis of the right middle lobe and only questionable disease of the right basal segments

THE SURGICAL PROGRAM

In many patients, such as those showing unilateral localized bronchiectasis the surgical ideal of extirpating all diseased tissue may be readily accomplished In the more complicated cases, however other aspects must be considered The desirability of removing all demonstrable disease depends on several factors In a patient with no contralateral involvement and a good respiratory reserve it is preferable to resect all areas of involvement provided the bronchographic evidence is definite Studies of pulmonary function may dictate the surgical program for borderline cases In a patient with poor respiratory reserve and no contralateral disease it is probably better to resect the major foci only, preserving such lesser areas of bronchiectasis as may be present. The same program is recommended should established disease of lesser extent be present on the contralateral side In such patients a more conservative resection is to be favored over a concerted attack on all the demonstrable bronchiectasis Careful follow up over an adequate period will then indicate those who require further resection Most patients with slight residual bronchiectasis following operation have not required additional resection A 95 percent cure" is frequently anticipated as a definitive result, fully acceptable to the patient and the surgeon alike The rationale of incomplete resection in such patients has received recent confirmation from the long term follow up studies of Rosemond et al *(59)*

Patients with bilateral bronchiectasis of unequal distribution pose the problem of choosing the side of initial resection Most surgeons favor attacking first the side presenting the more extensive disease as demonstrated bronchographically *(46)* Others *(53)* prefer to undertake the lesser resection first believing that the danger of anoxia is greater during the second resection because of the reduction of the contralateral lung by the previous operation and that their method guarantees a larger functioning lung at the critical second stage The former approach has however been adopted in this series of patients and the method appears to have been fully justified In several instances symptomatic relief following removal of the major focus has been sufficiently dramatic to warrant indefinite postponement or virtual abandonment of the contralateral resection which had been contemplated originally should the contralateral resection be necessary however the previous removal of the principal source of purulent secretions renders the second procedure much safer

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(59) R m nd G P Burne W E nd Humphr y L g J P g os of idual br hie ta f oc mpl t J Thor Surg 22 439-448 Nov 19 I

Segmental pulmonary resection, as conceived by Churchill and Belsey *(32)* and popularized by Overholt and Langer *(60, 61)*, has as its prime objective a maximum conservation of healthy lung parenchyma by reducing the size of the anatomically resectable pulmonary unit, which previously had been the lobe. This technic is particularly applicable to a disease such as bronchiectasis, which is segmental in type but frequently multilobar in distribution. The concept of retaining as much nondiseased pulmonary tissue as technically possible has, however, recently been challenged in one of its aspects by Bergin *(63)*. He believed that resection of all the basal segments of a lower lobe, with preservation of an undiseased superior segment alone, should be abandoned because of the high incidence of pleural complications in such patients and because of the tendency of the residual superior segment to develop bronchiectasis. In such a situation he advocated total lower lobectomy. A solitary residual superior segment of a lower lobe has been incriminated by others also as a cause of postoperative complications.

As early as 1939, Churchill and Belsey *(32)* drew attention to the occurrence of complete or partial atelectasis "in the dorsal segment of the lower lobe after resection of the inferior segments" and attributed it to "the inflammatory edema that must surround the focus of secondary healing in the bronchial tree." Coleman *(62)* reported his experience with 2 patients in whom a solitary residual superior segment showed poor aeration postoperatively. Bronchoscopy in those instances disclosed anterior rotation of the segmental orifice and this was considered to have been a possible factor in the development of postoperative atelectasis of that particular segment. Overholt et al. *(63)* mentioned 2 patients with "engorgement of the remaining superior segment of the lower lobe following segmental resection of the basal group." The first was proved at autopsy, which showed the residual superior segment to be engorged with blood without evidence of necrosis. The second was diagnosed by roentgenograms but made a satisfactory recovery. This complication of engorgement was attributed by the authors to possible obstruction of the venous drainage of the superior segment attendant on manipulation

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(60) Overholt, R. H., and Langer, L.: A new technique for primary segmental resection; application to treatment of bronchiectasis. Surg., Gynec. & Obst., 84: 257-268, Mar., 1947.

(61) Overholt, R. H., and Langer, L.: Technique of Pulmonary Resection. Charles C. Thomas, Publisher, Springfield, Ill., 1949.

(62) Coleman, F. P.: Discussion of paper by Overholt, F. H., Betts, R. H., and Ford, F. H.: Multiple segmental resection in treatment of bronchiectasis. Dis. Chest, 13: 583-595, Dec., 1947.

(63) Overholt, R. H., Woods, F. M., and Ramsay, B. H.: Segmental pulmonary resection in bronchiectasis; technique and results. J. Thorac. Surg., 19: 207-220, Feb., 1950.

and dissection of the basal segments Chamberlain and Ryan *(64)* preferred to preserve a solitary superior segment of the lower lobe believing that although the actual contribution of the residual segment to total pulmonary function is probably not great, it is of significant value as a "filler Overholt and Woods *(65)* maintained that preservation of a residual superior segment of a lower lobe is justified because in most patients there is less distortion of the remaining lung as it re-expands because the remaining superior segment of the lower lobe conforms to the triangular space left behind and below the upper lobe and the middle lobe or lingula if they are present.

We have reviewed our operative cases from this aspect. In 46 resections of the series here presented all the basal segments of a lower lobe were removed with preservation of the corresponding superior segment Pleural complications in these patients occurred with no greater frequency than was experienced with segmental resections involving other areas and the proportionate number of complications was not significantly larger than those noted following complete lower lobe resection Of the 46 patients 33 have been considered suitable for study in this regard satisfying the requirement of a postoperative interval of about 6 months in most cases and the availability of unequivocal preoperative and postoperative bronchograms In 30 of these patients there has been no evidence of postoperative bronchiectasis of the solitary residual superior segment. These results are contrary to the experience of Kergin *(53)*

The 3 patients who developed new disease postoperatively in a previously healthy superior segment will be mentioned briefly One of these a 28 year-old woman had severe cylindrical and saccular bronchiectasis involving the lingula and the basal segments of the left lower lobe as well as marked disease of similar type affecting the anterior segment of the right upper lobe the right middle lobe and the basal segments of the right lower lobe The affected segments on the left were resected and her postoperative course was smooth There was prompt pulmonary re-expansion and her drainage tubes were removed on the first postoperative day She was greatly improved following operation Bronchograms 6 months later, however, showed definite cylindrical bronchiectasis of the residual superior segment of the left lower lobe The second patient also had bilateral disease The lingula and basal segments of the left lower lobe were resected Her postoperative course was complicated by recurrent atelectasis on the left which necessitated repeated therapeutic bronchoscopy

(64) Chamberlain J M. and Ryan T C. Segmental pulmonary disease J Thor Surg 19 199-206, Feb 1950

(65) Overholt R H. and Tood F M. Segmental pulmonary resection for bronchiectasis South Surg 13 777-84 Nov 1947

Difficulty was experienced in obtaining re-expansion of the remaining segments of the left lung and the thoracotomy drainage tubes could not be removed until the fifth day The patient eventually developed a bronchopleural fistula and a small basal empyema It was not surprising that his postoperative bronchograms showed bronchiectasis of the previously normal superior segment (figs 15 and 16) In another patient, resection of the basal segments of the left lower lobe was performed as the first of bilateral operations The postoperative course was uncomplicated Bronchograms secured after resection showed minimal cylindrical bronchiectasis of one subsegmental bronchus in the residual superior segment Preoperative roentgenograms of this area were not of sufficiently good quality to delineate all bronchi well, and it is possible that the minimal bronchiectasis visualized postoperatively was present prior to resection

Of the 33 resections analyzed, definite bronchiectasis in a retained superior segment of a lower lobe developed in 2, an incidence of about 6 percent. One patient showed minimal bronchiectasis which may have been present preoperatively, and the remaining 30 had entirely nonbronchiectatic superior segments on adequate bronchograms usually made 6 or more months after resection Of the 13 patients who failed to meet the criteria of adequate pre and post-operative bronchograms and sufficient interval following resection, none showed clinical evidence of bronchiectasis when last seen

Preservation of a nonbronchiectatic superior segment of a lower lobe in which all the basal segments are resected appears, therefore, to be a justifiable and useful procedure In order to accomplish this with the anticipation of good results, the presence of endobronchial disease must be satisfactorily excluded prior to resection and strenuous efforts must be directed toward the prevention of postoperative complications such as atelectasis and delayed pulmonary re expansion (figs 15 and 16)

OPERATIVE CONSIDERATIONS

All resections in this survey have been performed according to a standard plan of procedure Preanesthetic medication, in addition to the usual atropine, morphine, and barbiturate, includes procaine amide hydrochloride, which is given in a dose of 1 gram by mouth prior to the induction of anesthesia Endotracheally administered nitrous oxide-oxygen ether has been the anesthetic of choice Pentothal sodium has been given intravenously for induction of anesthesia on a few occasions We strongly recommend that the anesthesia be kept simple and that polyanesthesia be avoided

The posterolateral approach is routinely used, with the patient in the lateral decubitus position In a brief trial, the face-down position advocated by Overholt and Langer *(60 61)* has appeared to present no advantage except in the control of secretions, the lung to be resected being dependent and tending not to discharge secretions into the contralateral bronchial tree In the present series reliance has been placed on other measures The preoperative use of postural drainage and antibiotics usually greatly reduces excessive secretions in patients who might otherwise constitute a serious operative problem Should troublesome secretions persist bronchoscopy with aspiration is performed immediately prior to the induction of anesthesia for operation Minimal topical anesthesia is used for bronchoscopy in order to assure maximal coughing during the aspiration of secretions The bronchus serving the area to be resected is clamped as promptly as possible in the course of the operation in order to secure early isolation of the distal mucopurulent reservoir This can usually be accomplished soon after the chest is opened and before attention is directed to the vascular structures Spillage is thus minimized Vigilance on the part of the anesthetist in carrying out frequent aspirations through the endotracheal tube is an important protective measure against contralateral spillage of secretions When indicated aspiration bronchoscopy is carried out at the termination of the operation

Depending on the area of lung to be excised subperiosteal resection of either the fourth fifth or sixth rib is performed to provide adequate exposure An intercostal incision is used in rare instances The value of palpation in confirming the extent of bronchiectasis as determined by preoperative studies has been found to be strictly limited This is in agreement with the findings of Belcher *(66)* who believed that while palpation may be extremely helpful in children because of a relatively more intense inflammatory reaction its importance in adults is slight The only really accurate information as to the extent and distribution of the disease is that obtained by bronchography and bronchoscopy No reliance can be placed on the gross operative findings when performing an operation for bronchiectasis Although the involved segments may be atelectatic emphysematous changes are not uncommonly encountered and there may be changes suggestive of chronic pneumonitis In cases of long duration particularly if the disease dates to childhood the affected areas may show a relative reduction in the amount of anthracotic pigmentation Even more commonly the lung may be entirely normal in appearance and consistency These facts emphasize the point that preoperative studies must not only have clearly established the

(66) Belcher R S Segmental resection of lung for bronchiectasis Lancet 1 845-846 June 8 1946

diagnosis of bronchiectasis, but adequate bronchograms must have delineated precisely the exact location of the disease At operation the segments previously shown to be involved must be resected regardless of their gross characteristics

The technic of careful hilar dissection and individual ligation is routinely used The bronchial stump is closed with interrupted sutures of No 000 black silk, although in several of the patients seen earlier No 50 cotton was used The type of suture material used in the bronchial closure appeared to exert no detectable influence on the incidence of empyema or bronchopleural fistula Although free pleural grafts have not been used, a second layer of closure with adjacent pleura or peribronchial tissue is always accomplished This is not a complete guarantee against the development of a bronchopleural fistula, but it contributes to earlier and more satisfactory healing of the bronchial stump While the anesthetist applies positive pressure up to 20 mm of water, the repair is tested under water for leaks, and any which are thus demonstrated are corrected Gravimetric determinations of blood loss are recorded throughout the operation and serve as an index of the amount of blood replacement necessary to maintain a constant circulating blood volume Immediately prior to closure of the pleura a solution containing 1 gram of streptomycin and 300,000 units of penicillin is instilled into the pleural cavity, unless a history of sensitivity to these agents has been elicited Such topical use of antibiotics is purely empirical and is probably not necessary because suction removes a significant amount of the solution soon after its instillation

Temporary interruption of the phrenic nerve in its intrathoracic course, either by crushing or by procaine infiltration, has been performed in some instances if the volume of lung parenchyma resected was relatively large The problem of overdistension of the remaining pulmonary tissue following extensive resection has been a matter of great interest to us Hay et al (67) recorded a more favorable functional status postoperatively in those patients whose ipsilateral hemidiaphragm was temporarily paralyzed following pulmonary resection for bronchiectasis than that shown by a comparable group in whom the phrenic nerve was not crushed In the relatively small number of patients in whom we have employed temporary phrenic paralysis, the postoperative course has seemed to be somewhat more difficult, this point, however, has not been definitely established

When a subtotal resection has been completed, 2 thoracotomy tubes are routinely inserted and active suction is applied by means of a 2 bottle underwater seal suction setup (fig 24)

(67) Kay E B. Perkins H. M. and Crastin pol P Fate of re idual lobe follow-g pr v s l bect my Tr N t Tube c A 1951 p 194

The amount that the height of the column of water in the second bottle exceeds that in the first bottle determines the amount of suction applied When a high negative intrathoracic pressure is desired or when there is a large air leak, a tall bottle (50 cm) replaces the second bottle Full suction (determined by the power of the motor) results when the Hoffman clamp at the second

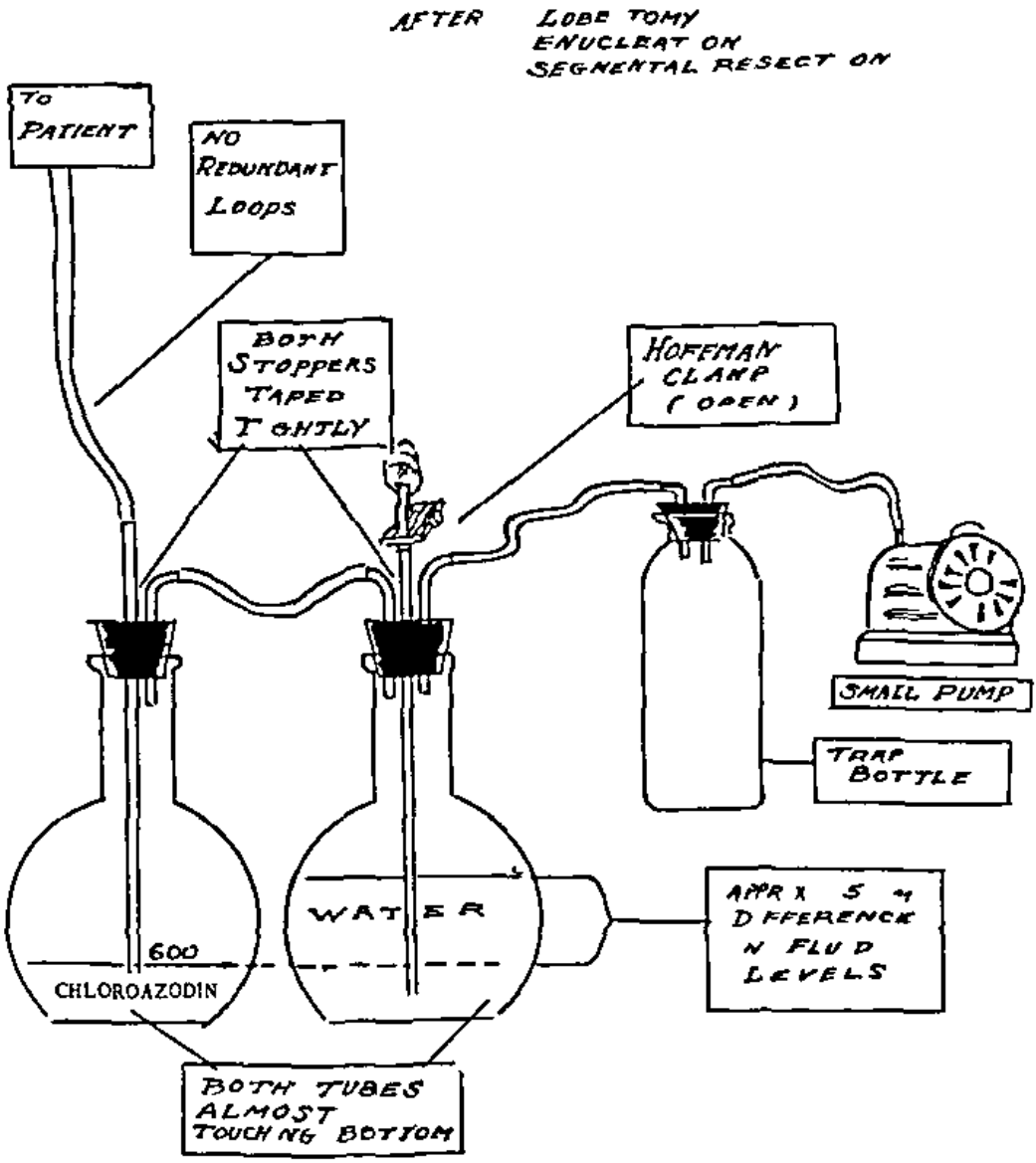


Figure 24 Postoperative drainage apparatus

bottle is closed The trap bottle assures that no moisture enters the suction pump Size 30 Fr red rubber rectal tubes are used Smaller tubes become plugged too easily Placement of the tubes is most important The posteroinferior tube is introduced through a stab wound and passes through the eighth intercostal space to lie in the paravertebral gutter The anterosuperior tube traverses the second anterior intercostal space in the midclavicular line its tip being fixed to the extreme apex of the pleural cavity by

a single fine absorbable suture Each tube is passed through the chest wall obliquely so that it will assume a favorable position against the chest wall and so that no air will enter the chest when it is removed In pneumonectomies only a small (16 Fr) anterior catheter is used It is attached to an underwater seal system without suction with a 2 bottle setup so arranged as automatically to maintain a nearly neutral intrathoracic pressure (fig 25) A negative pressure may be obtained by increasing

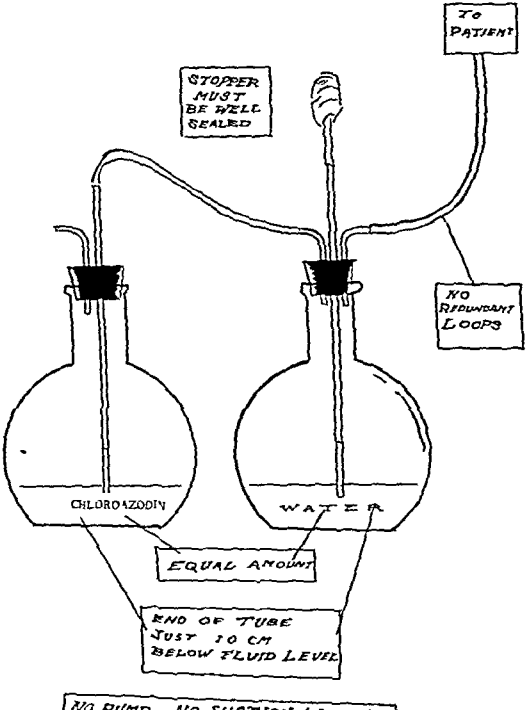


Figure 25 Postpneumonectomy drainage apparatus

the amount of water in the right hand bottle the amount depending on the height by which the water column in this bottle exceeds that in the left hand bottle Conversely, a positive intrathoracic pressure may be achieved by shifting the height differential in the opposite direction

STANDARD POSTOPERATIVE MANAGEMENT

Alert and careful postoperative care is important in patients who have undergone resection for bronchiectasis and anticipated good results may be vitiated by unrecognized or inadequately treated complications The postoperative responsibility rests not only on the operating surgeon but on the nursing staff as well Skilled nursing care is indispensable After operation the patient is returned to a previously warmed bed and frequent changes of position are effected An intratracheal suction catheter is used as needed to remove secretions from the respiratory passages Coughing is encouraged and assisted In the early postoperative period the patient is frequently raised to the sitting position and the side of operation firmly supported while he coughs A bedside roentgenogram of the chest is secured as soon as the patient has reacted from the anesthetic sufficiently to be raised to the sitting position and the postoperative pulmonary status thus determined Subsequent roentgenograms are made at daily intervals for the first 3 postoperative days or more frequently if indicated

Because the administration of oxygen in the immediate postoperative period is a time honored procedure we were reluctant to abandon it. We have previously followed a series of patients in whom lung segments were resected for bronchiectasis who received oxygen routinely in the immediate postoperative period The patients reported herein comprise a comparable group in whom oxygen was used only on definite indication Our observations have convinced us that it is contraindicated except when the need for additional oxygen has been clearly established Oxygen therapy is of prime value only in anoxic anoxia and its routine use in the postoperative management of patients who *have had a pulmonary resection is at best unnecessary and is* frequently hazardous

Price et al *(68)* have shown experimentally that only when respiration was definitely embarrassed by central depression tracheal obstruction prolonged inspiratory resistance pneumothorax or constriction of the chest and abdomen was oxygen therapy of any demonstrable value On the contrary these investigators produced death by the administration of pure oxygen to dogs in the late stages of shock when respiratory embar-

(68) Price P B Richard R C and Hemmer J B Evaluation of oxygen therapy A Surg 130 747 754 Oct 1949

rassment coexisted with the hypotension, and concluded that the alleviation of dyspnea may decrease the pumping action on venous return of blood to the heart, resulting in a sudden fatal reduction of cardiac output They also observed that relief of dyspnea by the administration of pure oxygen to dogs with respiratory difficulty was constantly associated with a significant fall in blood pressure

One of the most dangerous features of oxygen therapy lies in the tendency to use it while neglecting to ascertain and correct the true cause of the patient's difficulty Dyspnea, cyanosis, or hypotension in patients who have undergone resection for

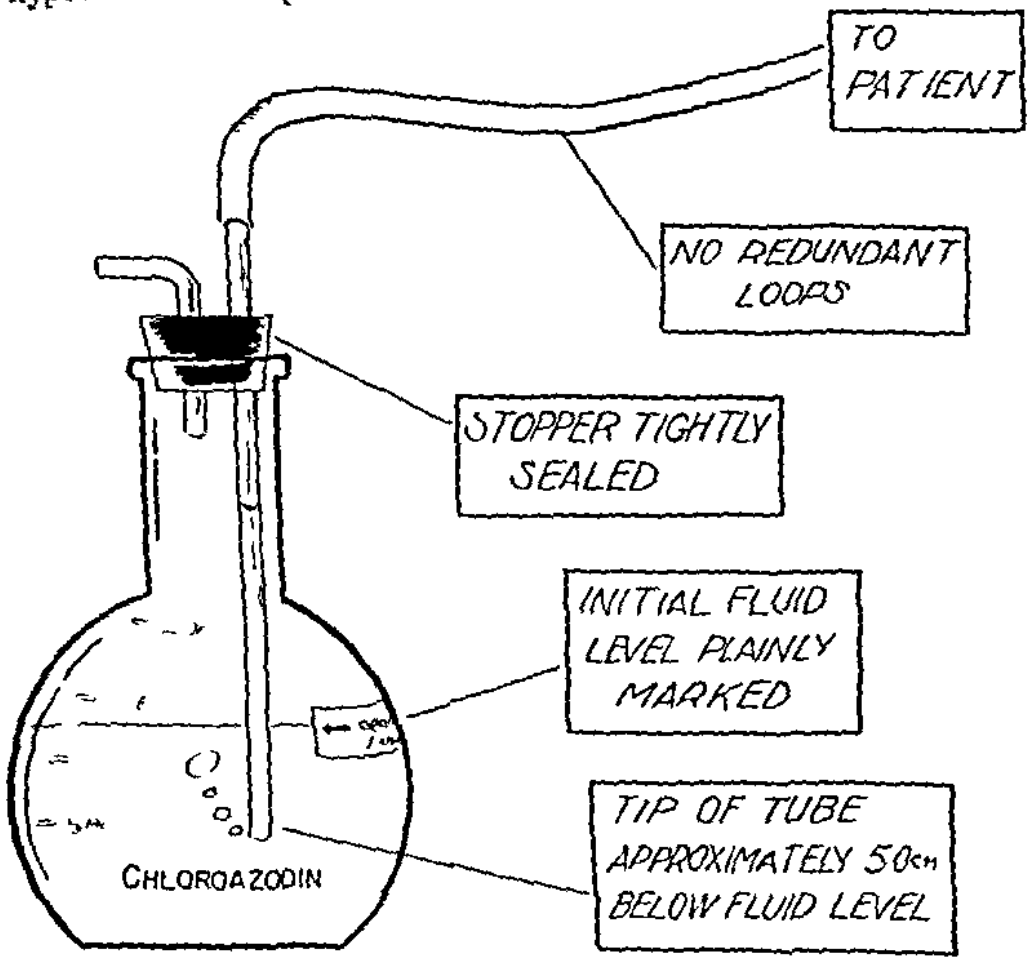


Figure 26 Simple underwater seal apparatus

bronchiectasis are usually ascribable to such causes as an obstructed airway or inadequate circulating blood volume rather than to insufficient oxygen in the inspired air Finally, the prolonged administration of oxygen tends to inspissate secretions and render them more difficult to raise, either by cough or by aspiration, thereby increasing the incidence of atelectasis Although oxygen therapy has a definite role in the postoperative management of bronchiectasis, its indiscriminate use should be avoided





Figure 27 P t oa t ior bronchogr m bow g tot l cy tic and acc la br h ctasi on the left The ght l g wa fr e of dis as Figure 28 L f lat l bronchogr m wbi h co firms d agnos of total bron biecta i on the left

Antibiotics, especially penicillin, are administered post-operatively as a prophylactic measure Suction via the thoracotomy tubes is continued on the patients' return from the operating room The amount of drainage obtained is carefully noted at frequent intervals A negative pressure of from 8 to 10 cm of water is used initially This is increased, however, if there is an appreciable air leak Sufficient negative pressure is used to "get ahead" of the air leak This may amount to 40 or more cm of water Suction is continued until there is no further air

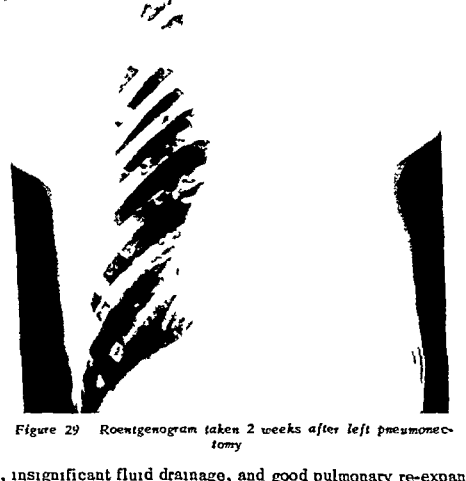


Figure 29 Roentgenogram taken 2 weeks after left pneumonectomy

leak, insignificant fluid drainage, and good pulmonary re-expansion as shown by roentgenograms At this juncture a trial of several hours on simple underwater seal (fig 26) without suction is invoked in order to determine whether an air leak of significant magnitude will recur Should no air be withdrawn on full suction at the conclusion of this interval, the tubes are removed, otherwise suction is continued and the procedure later repeated Satisfactory pulmonary re-expansion could be obtained in most patients by the use of a *simple* underwater seal system, but active suction is more prompt and effective In pneumonectomies, no suction is applied to the intercostal catheter, which is used

merely to obviate sudden pressure changes within the pneumonectomy space Its use obviates the necessity for frequent thoracenteses for manometric determinations and reduces the hazard of either a sudden tension pneumothorax or a dangerously high negative intrathoracic pressure Ambulation is begun as soon as practicable, usually on the first or second postoperative day

Permanent collapse therapy is indicated in patients who have had pneumonectomy or who develop mediastinal displacement or overdistention following lesser resections Postpneumonectomy thoracoplasty was performed in 6 of the 7 patients who underwent total unilateral resection (figs 27 29) the seventh having died during operation This was accomplished as a one-stage procedure in all instances the thoracoplasty being of the tailoring type involving the second through the eighth ribs In this procedure moderately long segments of the ribs (but not the transverse processes) are removed Little deformity results A limited upper thoracoplasty was performed in 1 patient who had an upper lobe resection Morbidity and mortality from secondary thoracoplasty have been nil

TABLE 1 *Op t c pl t ns 100 p t t*

C pl at	N mb
Ca d t	2
F l	(1)
N f t l	(1)
Ope t h h g (f l)	4
M d t l rnphy m (l t of tr h)	1
T t l	7

COMPLICATIONS AND MANAGEMENT

Despite careful selection painstaking operation and a satisfactory pre- and post operative regimen an uneventful course cannot be anticipated in all patients The significant operative postoperative and late complications occurring in this series are shown in tables 1–4 Postoperative complications have been classified as major when satisfactory management demanded a return to the operating room those successfully treated on the ward have been designated as minor

In this series of 100 resections 2 patients died The first was a 33 year old man with severe symptoms and extensive bilateral disease There was advanced saccular disease of the right middle

lobe and the anterior segment of the right upper lobe, but only moderate cylindrical involvement of the right lower lobe Because of widespread disease on the left, for which a later resection was planned, only the middle lobe and anterior segment of the upper lobe were removed The operation was rendered difficult by extremely dense adhesions and numerous hard, matted lymph nodes surrounding the middle lobe bronchus and vessels The situation was one in which the modified tourniquet technic advocated by Bryant and Harter *(69)* might well have been used Suitable lengths of the middle lobe vessels could not be freed for secure double ligation The patient had a fatal hemorrhage on the first night after operation Autopsy showed that the ligature, still attached to the viscero vascular fascia, had rolled off the short stump of the medial branch of the middle lobe artery

TABLE 2 *Major postoperative complications in 100 patients*

Complication	*Numbe*
Hemorrhage	3
Terminating fatally	(1)
Requiring reoperation for control	(2)
Large bronchopleural fistula with empyema	1
Acute surgical abdomen	1
Total	5

The second death occurred in a 25 year old man whose left lung was totally destroyed by cystic and saccular bronchiectasis secondary to extreme stenosis of the left main stem bronchus He had a huge anterior mediastinal hernia, most of the left chest being filled with herniated right lung (figs 30 33) At operation the patient had what amounted physiologically to a bilateral open chest because of the greatly thinned out and stretched mediastinal pleura Frequent aspirations of purulent secretions were necessary throughout the operation, and when the positive pressure anesthesia was temporarily discontinued for this to be accomplished, the right as well as the left lung would collapse During the late stages of the operation, the patient was frequently cyanotic despite heroic efforts on the part of the anesthetist to maintain adequate oxygenation Postoperative bronchoscopy was performed and cardiac arrest occurred during the procedure Prompt cardiac massage was of no avail and the patient died It is reasoned that

(69) Bryant J R and Harter J S Middle lobe disease Dis Chest 18 250-253 Sept 1950

the arrest was initiated by a vagovagal reflex Sloan *(70)* has shown that these fatal reflexes occur almost exclusively in the presence of hypoxia

TABLE 3 *M or post p rat compl at 100 p t nt*

Compl cat	—	*N mb*
Bron hopl ur l fi tula		4
Small	(4)	
Larg	(1)	
La ur l k		11
Partial at l t is		16
Ope ive d	(15)	
Cont lat l d	(1)	
Pleur l ffus n		17
St r le	(7)	
C nt mina d	(4)	
Inf ted (mpy ma)	(6)	
Hemorrhage not eq ir g pe t on		1
W und ompl t on		2
S pe f al wound d h	(1)	
S bcuta eous bs t t be t	(1)	
P mon t ontr l t al lung		1
P umothorax poo ous ontralat l d		1
P t pe at asthmat p od		3
Emphy m ubcut n us tens		3
Hypot ns n pr longed ot due t bl od l		1
Thromb phleb t of leg in us d for nfus on		2
N rv njury		3
Radial n rve	(2)	
N ur lg my tr j hy (h uld girdle yndr me)	(1)	
Tot l		65

On la g b nch pl ur l f ula w nc un d h I major po: pera mpl nd in lod d tabl 2 I t d th tabl l in ord ha h true in d f br h pl ural fis ula may be fl d In many gl pa had s l f be mpl ns nd mos f ts had ll

The patient with cardiac arrest who died has been discusse the other was a 23 year old marine with extensive bronchiectasi of both lower lobes undergoing the first of bilateral resection: In the course of testing the bronchial closure after resection c the basal segments of the right lower lobe, excessively hot irri gating fluid was used Cardiac asystole resulted and was imme

(70) Sloa H. E V gus nerv dia rr ff f hype pnia hypoxia ad phyxia on fl nh b f heart Surg Gyn & Ob 91 257 264 Sept 1950

diately detected Vigorous cardiac massage resulted in restoration of spontaneous normal rhythm within 30 seconds There have been no neurologic or other sequelas and the patient has subsequently undergone an uneventful contralateral resection

TABLE 4 *Late complications in 100 patients*

Complication	*Number*
Jaundice (homologous serum?)	2
Bronchiectasis (new disease not present prior to operation)	2
Pulmonary tuberculosis with cavitation	1
Severe exacerbation of pre-existing atopic dermatitis	1
Total	6

It has not been possible to study all patients bronchographically subsequent to their operation If such studies could be carried out this figure might be somewhat higher Of the patients how ever had postoperative signs or symptoms suggestive of new disease

There were 4 instances of operative hemorrhage of grave proportion In 1 patient during right pneumonectomy, bleeding resulted from a tear in the main pulmonary artery, and intrapericardial ligation was necessary for hemostasis In the second patient, the contemplated procedure had been resection of the right lower and middle lobes which were completely involved with cystic bronchiectasis, but hilar dissection was impeded by dense inflammatory tissue, and in the process of mobilization a rent which could not be repaired developed in the right main pulmonary artery Pneumonectomy was therefore required In a third patient, in whom resection of the posterior division of the apicoposterior segment of the left upper lobe was performed, a small tear occurred in the main trunk of the left pulmonary artery Repair was effected by suturing the defect with No 00000 atraumatic silk without compromising the arterial lumen In the fourth patient, serious hemorrhage occurred during the course of a left lower lobe lobectomy The main trunk of the pulmonary artery above the branch to the superior segment was torn during a difficult dissection Suture was successfully accomplished

One patient was observed to have mediastinal emphysema as soon as the chest was opened The anesthetist had experienced great difficulty in introducing the intratracheal tube, and investigation of the cause of obstructed breathing showed that the Magill catheter was kinked on itself This was corrected and the operation proceeded uneventfully There was moderate

I ig 30 P oa t tor l fi bronch gram howl g xt s cyst c and a c lar bro h ctasi vol l g the t left l g The l g l c mplet ly at le tati The a t d l g in the uppe ch st r pres t h iated ghl l g Figur 31 Left lat l bro cho gr m howl g th totally bro hi t tic l fi l g whi h i gr atly o t a t d and which lie i the c stove tebral g ti The normal bro hi se w i hi p f c tow pr oil i be ighi bronchial i e N t the h g a t ior media ti al he ta

33

Iodized oil (Lipiodol) spilled over into the left bronchial tree at this ex
The original stereoscopic frontal films clearly outline the configura
Angiocardiogram which shows that the distribution of

emphysema of the face and neck postoperatively which required no treatment. Postoperative bronchoscopy revealed a small jagged eroded area in the mucosa of the posterior membranous wall of the proximal portion of the trachea just beyond the cords We believe that this represented the site of a small tracheal laceration caused by the beveled tip of the intratracheal tube It had sealed over spontaneously and required no special therapy The patient's postoperative course was smooth and there were no symptoms suggestive of mediastinal infection Antibiotic therapy was continued longer than usual in this patient and streptomycin was given for several days in addition to the penicillin which we give routinely

There were 5 major postoperative complications in this series of resections The patient with postoperative hemorrhage terminating fatally has been discussed In 2 other patients postoperative hemorrhage was manifested by an undue amount of blood recovered from the pleural cavity via the thoracotomy tubes and by failure of the blood pressure to stablize despite repeated transfusions Because in these 2 patients the degree of hemorrhage threatened life the chest was reopened In 1 patient this was done 14 hours postoperatively and disclosed several points of active bleeding from diaphragmatic adhesions which had been severed at the time of resection These were ligated and the patient made an uneventful convalescence which was no longer than that of the average uncomplicated case Exploratory thoracotomy in the second patient was performed 8 hours postoperatively and revealed brisk hemorrhage from a small esophageal artery situated in the posterior gutter immediately inferior to the area from which the pleura had been mobilized for the second layer of bronchial closure The bleeding point was ligated and convalescence was neither complicated nor prolonged These 3 cases of serious postoperative hemorrhage demonstrate that reoperation cannot be too long delayed in the presence of continued bleeding In the patient who died operative intervention was not considered imperative until he was moribund, by which time it was not feasible

One patient developed extensive empyema and a large bronchopleural fistula following resection of the right middle lobe and basal segments of the right lower lobe Culture of the purulent pleural exudate consistently yielded *Pseudomonas aeruginosa* Intensive antibiotic therapy and drainage via an intercostal catheter failed to produce improvement and the empyema was not effectively controlled until open thoracotomy with resection of a short segment of rib had been performed With adequate drainage clearing was rapid and complete and the fistula quickly closed Six months after his operation the patient was asymptomatic and bronchograms showed no residual bronchiectasis

The fifth major complication was seen in a patient who had undergone right middle lobectomy Severe abdominal pain, rigidity of the abdominal wall, pronounced leukocytosis, and inconclusive roentgenographic evidence suggestive of pneumoperitoneum developed on the second postoperative day An exploratory laparotomy was performed with completely negative results The patient's symptoms promptly subsided and he made an uneventful recovery The pneumoperitoneum, if indeed one was actually present, did not recur and its cause was undetermined This should perhaps more properly be classified as an error in diagnosis rather than as a major postoperative complication

In this series the most significant minor postoperative complications were small bronchopleural fistulas or persistent parenchymal air leaks We did not use needle aspiration in treating these fistulas, believing that a safer, quicker, and more certain method is to insert an intercostal catheter initially and apply suction The 11 patients in whom a brief period of suction resulted in permanent cessation of the leak have been classified simply as late air leaks Prolonged suction was required in 4 patients, and these have been listed under *small fistulas* Pneuroperitoneum, with or without temporary phrenic nerve paralysis, has occasionally been used to assist in stopping a small air leak with gratifying results We believe that judicious use of these measures will eliminate the necessity of reoperation in almost all patients with persistent bronchopleural fistula unless a major bronchial stump has reopened

An especially important complication is atelectasis In the critical early postoperative *period this must* be suspected in all patients who show roentgenographic evidence or physical signs of faulty aeration Partial atelectasis occurred in 1[illegible] patients, 15 times on the operated side and once contralaterally Intratracheal catheter aspiration, using the technic of Haight *(71)*, is usually carried out as an initial procedure and has frequently been found effective in relieving the atelectasis, perhaps due as much to stimulation of the *cough* mechanism as to direct aspiration of obstructive material Repeated aspirations may be necessary If, however, results of *intratracheal* suction are not apparent reasonably soon, a therapeutic *bronchoscopy*, with aspiration, is performed at the bedside of the patient This is [illegible] as indicated and in our experience has never failed to [illegible]

The basic cause of the atelectasis is usually the presence of thick tenacious secretions which the patient cannot [illegible] Certain medical measures may aid in preventing [illegible]

(71) Haight, C. Intratracheal [illegible] Ann. Surg. 107: 2[illegible]

administration of sodium iodide has recently been proposed (7°) but we have had no experience with this We have found steam in halations, with or without tincture of benzoin, of most benefit We have not been impressed with the value of oxygen carbon dioxide and believe that as much or more can be accomplished by encouraging voluntary deep breathing and coughing Cough must be assisted as well as encouraged Raising the patient to an up right position and supporting the chest on the operated side aids the patient greatly in coughing effectively Drugs designed to thi and loosen secretions, such as ammonium chloride may be c some value and they are used occasionally

The use of sedation requires fine discrimination The ideal i to give sufficient amounts to control pain so that the patient wi not refrain from coughing yet not enough to unduly dull the cou reflex We usually give 50 mg of demerol p r n only for th first 2 postoperative days and 65 mg of codeine sulfate p r i thereafter Recently we have been injecting the intercostal nerve in the region of the incision with a long acting anesthetic agen at the time of operation We inject 5 cc of efocaine solution a each site near the angles of the ribs This anesthetizes the cor responding nerve as well as 2 above and 2 below it Our prelimi nary impression is that the local block permits more effectiv coughing and diminishes the narcotic requirements The greates reliance, however must be placed on mechanical measures Once the presence of atelectasis is demonstrated or even suspected the measures available for its relief must be used promptly

Pleural effusion of variable degree and cause may follow ex cision and it is important to determine whether it is sterile con taminated with potentially pathogenic bacteria or infected with purulent bacteria (empyema) In 18 patients in the present series postoperative roentgenograms and fluoroscopy demonstrated an accumulation of pleural fluid on the side of operation In 7 in stances it was aspirated and found to be sterile A moderate amount of fluid is to be expected following thoracotomy and spontaneous absorption usually occurs In cases in which the fluid is excessive in amount or persistent however thoracentesis should be performed or catheter drainage instituted In the present series prompt aspiration was the rule Four patients developed pleural fluid which was not purulent but from which patho enic bacteria were cultured These are considered contaminated pleural effusions In addition to the previously mentioned patient with extensive empyema for whom thoracotomy drainage with rib re section was necessary 6 patients developed small but definite purulent effusions All responded satisfactorily to closed inter costal catheter drainage and antibiotics

(72) Bak J M R tt g L C. nd Curt G M P d ment of t T c by c l f br nch l A n Surg 134 641 652 Oc 1951

In addition to the previously discussed hemorrhages, 1 patient had a definite postoperative hemorrhage, which did not threaten life because there was prompt and satisfactory response to transfusions and other supportive measures Complications referable to the operative wound were negligible They consisted of a small subcutaneous abscess at the site of a thoracotomy tube, for which simple drainage proved effective, and a single superficial wound dehiscence involving skin and subcutaneous tissue only, for which secondary suture was satisfactory In 1 patient, there were 2 episodes of pneumonitis on the unoperated side, for which antibiotic therapy proved effective Contralateral spontaneous pneumothorax complicated the postoperative course of 1 patient. He was treated by suction via an intercostal catheter with good results Three patients exhibited definite episodes of asthma postoperatively, for which no cause could be determined Aminophylline given intravenously was uniformly successful in controlling the symptoms

Subcutaneous emphysema of limited extent may be expected in a small percent of patients undergoing pulmonary resection It is usually minimal and commonly recedes spontaneously In one instance in this series it was so extensive and persistent that subcutaneous aspiration was considered advisable, although not urgently required One previously normotensive patient exhibited a pronounced hypotension for a period of 1 week following operation This was unrelated to surgical shock, but the possibility of a latent adrenal insufficiency activated by operation could not be excluded Thrombophlebitis of the leg veins used for infusion occurred twice as a postoperative complication, but in each instance a conservative medical regimen proved satisfactory Neither patient was given anticoagulants

Complications referable to peripheral nerves were encountered on 3 occasions In 2 instances a definite but incomplete radial nerve injury, due to faulty positioning of the patient on the operating table, became apparent immediately following operation Gradual and complete recovery occurred spontaneously and was hastened by physiotherapy The surgeon and anesthetist should be acutely aware of the possibility of peripheral nerve injury when positioning the patient for any intrathoracic operation, especially when the patient is heavy or the procedure apt to be unusually lengthy Although no permanent disability resulted from the nerve injuries observed in these patients, the length of hospitalization was prolonged On the tenth postoperative day 1 patient, who had undergone resection of the basal segments of the left lower lobe and of the lingula, noted the sudden onset of pain in his right upper extremity and right shoulder Marked paresis of the extremity became evident within a short period Physiotherapy and medical measures effected but slight improvement. Five months after

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(72) Bak J I Roe g L C nd Cur G M P t nd tr me of T by l f br h l t A Surg 134 641 652 Oc 1951

for an average of 4 years Although the reasons for such an apparently high incidence are largely theoretical, the need for intensive preoperative screening to exclude the presence of tuberculosis is again stressed

RESULTS

Of the 92 patients studied, 70 have completed the originally planned surgical treatment and have been followed for at least 6 months postoperatively so that the results are considered suitable for analysis Chief reliance has been placed on measurement of daily sputum output before and after operation Patients in whom sputum was absent or negligible postoperatively have been classified as having an excellent result Those in whom sputum persisted but was less than one fourth of the preoperative amount have been designated as having a good result Not infrequently there is a favorable change in the character of the residual sputum in that it is thinner and less purulent. A reduction in the sputum by one half was considered fair, and less favorable results poor Patients in whom such outstanding symptoms as hemoptysis or recurrent pneumonic episodes were not significantly influenced by resection have also been classified as poor When obtainable, the opinion of the patient regarding the efficacy of resection has been weighed In the rare patient with no significant sputum preoperatively, reliance has been placed on the extent of bronchographic improvement following operation

In the 70 patients followed for 6 months or more, the results are classified as excellent in 51 (73 percent), good in 12 (17 percent), fair in 4 (6 percent), and poor in 3 (4 percent) The results following right middle lobectomy were uniformly excellent because the disease was localized and amenable to complete removal Unilateral resection of basal disease also produced gratifying results The results following the pneumonectomies for total unilateral bronchiectasis have been most satisfying In the 7 patients with bilateral resection, results have been excellent in 3 and good in 3 The remaining patient has not been followed long enough for accurate evaluation but his functional status is satisfactory, he is symptom free, and has been restored to full duty

Although complete extirpation of diseased tissue is ideal, in patients with extensive involvement much is to be gained from a well planned resection program, despite the necessity of retaining diseased areas Thus, in 16 patients with significant residual disease, results were classified excellent in 5 (31 percent), good in 5 (31 percent), fair in 3 (19 percent), and poor in 3 (19 percent)

The ultimate goal is to restore the patient's ability to perform unrestricted physical activity Among military personnel, there is no better measure of the degree to which this has been achieved

than the ability of patients to perform active duty following their operation Our results in this respect are shown in table 5

TABLE 5 *D pos tion f act -d ty p l t at d g lly f b on b ta s*

D p t	*N mb*	*P e t*
R tur d to f ll d ty	50	68 50
R tur ed t l m t d d ty	2	2 75
S ll h pit l d	11	15 00
D th	2	2 75
D sch g d by m d l urvey	8	11 00
W th th d g of b h e t	(3)	(4 0)
For d t oth r th b o h ct	(5)	(7 0)
Bro h l sthma (1) ur lg myoc phy (1) d p lm y t be c l (3)		
T t l	73	100

Al h ugh h ns pe nel nclud g d pend ts nd benef ia f th V rans Admu have be m tted f m h tabl h l ha g p n p ng 19 pa ha be g nerally ll E h f th pa ha be b me h or h usual oc pat

Of the 11 patients awaiting disposition, it is anticipated that all but 1 will be returned to full duty increasing to 85 percent the number returned to duty One patient who underwent right pneumonectomy for unilateral total bronchiectasis was given an 18 month trial of duty but was then surveyed from the Navy because of dyspnea on exertion and easy fatigability Nevertheless resection had given him marked symptomatic improvement.

SUMMARY AND CONCLUSIONS

One hundred successive resections for bronchiectasis were performed on 92 patients Seven of these had bilateral operations and 1 had 2 resections on the right as well as 1 on the left In the 70 patients followed for 6 months or more the results were excellent in 73 percent good in 17 percent fair in 6 percent, and poor in 4 percent

Complete bronchographic mapping of all lobes of each lung is a preoperative requisite when resection is contemplated The results of excision vary directly with the degree to which extirpation of all diseased areas has been approached

In 46 patients the basal segments of a lower lobe were resected with preservation of the superior segment. Of these, 33 were submitted to critical analysis Only 3 showed bronchographic evidence of bronchiectasis developing postoperatively in the residual superior segment. This study suggests that preservation of a non-

bronchiectatic superior segment of a lower lobe in which removal of all the basal segments has been performed is a useful and justifiable procedure The presence of endobronchial disease in the superior segment must be excluded prior to resection Postoperative complications, such as atelectasis, must be prevented or vigorously treated if a healthy residual superior segment is to be assured

Two deaths occurred in this series of 100 resections One resulted from cardiac arrest and one was due to postoperative hemorrhage Both are judged to have been preventable Five major postoperative complications occurred Prompt reoperation may be indicated in patients who show evidence of continued bleeding following resection The most significant minor complications were small bronchopleural fistulas Closure was obtained in all patients without resorting to direct surgical attack Judicious use of pneumoperitoneum, with or without temporary phrenic nerve paralysis, will obviate the need for secondary surgical closure in almost all such patients with bronchopleural fistula An especially important postoperative complication is atelectasis Its satisfactory treatment demands early recognition and the energetic use of mechanical and other measures for its correction

Excision continues to constitute the only curative treatment available for bronchiectasis Medical therapy, nevertheless, is frequently of value in patients for whom resection is contraindicated or to whom a complete surgical program cannot be offered The therapy for each patient must be individualized

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PSYCHOTHERAPY WITH COMBAT FLIERS[1]

ROBERT J LIFTON *First Lieutenant* USAF (MC) [2]

AIR Force combat personnel are carefully selected, well trained, and highly specialized Most of the responsibility for their mental and physical health falls to their flight surgeon Although in Korea air crewmen are a small percent of the forces engaged in active fighting, their morale, enthusiasm, and performance have generally been extremely high This results from their training, their love of flying, strong group feeling, and the knowledge that there are a definite number of missions to be accomplished I will consider these only as they relate to emotional problems encountered during combat missions

Psychiatric difficulties among fliers in combat fall roughly into 3 categories (1) anxiety reactions during early missions, (2) effects of undue external stress in the course of the combat tour, and (3) tension related to final 10 or 15 missions

ANXIETY REACTIONS DURING EARLY MISSIONS

In the group of early anxiety reactions the flight surgeon frequently can be most effective The initial adjustment that a combat pilot must make in Korea is not easy Like everyone in Korea, he is in an undesirable location, living with few comforts, and far from his family He may be a reservist who has flown a previous combat tour in World War II and resentful of again having to risk his life He may be a former multiengine pilot, recently assigned to jets, who is not sure that he likes the change He may be a fairly recent graduate of flying school who is apprehensive about being exposed to the "real thing" He may have mixed feelings about our war effort in Korea and, considering the small number of airmen being exposed to immediate danger, wonder why he out of so many was chosen for this task Finally there is the ever present danger that he may be killed injured, or captured by a savage enemy

When an airman first arrives here and begins to take part in his training missions, he is likely to feel that he is an outsider He is not yet part of the group whose members gather nightly at the

(1) From Lifton R J Psychotherapy with combat flying personnel Far East Air Force Surgeon Newsletter No 26.

(2) Headquarters Fifth Air Force San Francisco Calif

club to swap combat experiences When he gets checked out in his aircraft and flies his first few missions a dramatic change occurs The situation that seemed so difficult has now been mastered He has come through his baptism of fire and become a member of the in group " He can now look on new arrivals in a paternal fashion He identifies himself strongly with his unit enjoys its competition with other squadrons and absorbs enou h of its strength generally to enable him successfully to complete his combat tour without major emotional difficulties

This conquest of initial fear and integration into the group does not always go so smoothly and it is quite common for pilots to experience anxiety symptoms of varying severity in this period Some complain of nervousness inability to sleep poor appetite and weight loss, or such somatic expressions as upper abdominal pain general fatigue blurred vision or low back pain At this point before an incapacitating neurotic or fear of flying syndrome has crystallized sensitive and artful handling of the problem by the squadron s flight surgeon can pay the greatest dividends

The confidence gained from successful completion of early missions and the ties developed usually allow the officer to free himself of his symptoms without medical aid Many of the more aggressive pilots because of their need for outward show of strength and independence, attempt to deny their fears and mini mize their difficulties If they seek help at all it may be in the flight surgeon s quarters rather than in his office that they request a pill for their stomach or nerves In these situations a flight surgeon may do well to accept this attitude dispense the palli ative medication and assume a casual but friendly manner He should respect the patient s need to work out his own difficulties This attitude of watchful waiting greatly benefits the patient through the recognition perhaps unconscious that he has a reliable professional person to whom he may turn should matters become worse With a dependent or withdrawn flier however the flight surgeon must play a more active role

Case 1 A 24 year old jet fighter bomber pilot, while engaged in precombat training missions complained of pain in the ears aggravated by putting on his earphones The flight surgeon ex amined him and made a diagnosis of external otitis He believed that the patient was exaggerating his complaint but grounded him for 2 days and successfully treated the condition The patient then revealed that he also had blurred vision and at the time of his annual physical he asked for a "special eye check up When he was informed his eyes were not abnormal he said, in a manner that did not convey a feeling of relief That was one physical that I did not expect to pass He continued to make daily visits

to the flight surgeon, ostensibly for observation of his ears, and seemed to enjoy talking to his doctor He at first discussed general topics but soon began to reveal the problems that were bothering him

He was a volunteer and had recently completed his jet training, during which he had an accident after losing power on a take off Since that time, he experienced a marked fear on taking off Later, when preparing for a training flight, he saw another jet have the same type of accident This increased his apprehension He had recently married and apparently felt insecure in his relationship with his wife He had studied to be a commercial artist, but became discouraged when he did not meet with immediate success and decided to take up flying as a career

He was an extremely dependent, overingratiating but isolated person who did not seem to enjoy group activities At least unconsciously, he sought grounds for medical disqualification but had a too highly developed conscience to be a malingerer The approach used by the flight surgeon was to lend a "sympathetic ear" He encouraged the pilot freely to discuss his difficulties and reassured him that many others with similar problems were able to overcome them and fly effectively He made himself readily available but wisely avoided the formation of the close social relationship which the pilot actively sought At the time of writing, this officer had completed 6 combat missions He was still "shaky" but somewhat less disturbed than originally He continued to be fearful on take off, but had relatively little anxiety over the target After completion of each mission, he experienced marked fatigue

Comment This case illustrates the very common preoccupation with physical complaints as a reflection of anxiety The pilot's personality difficulties predisposed him to this type of reaction and he felt like an outsider in his unit, unable to obtain or respond to the much needed support of the group Early recognition of the problem by the flight surgeon and prompt response to the patient's needs afforded moderate therapeutic success although the eventual outcome is uncertain

Case 2 A 26-year old B 26 pilot was noted to be frequently "aborting" his missions before take off because of inconsequential but legitimate minor criticisms of the aircraft He was also drinking fairly heavily The flight surgeon noted that he was an aggressive hostile person and was outspoken in his criticism of actions taken by a new commanding officer His resistance to his missions reflected both his fear of combat and a passive aggressive reaction to his resentment of the leadership in his unit

During an interview the flight surgeon referred indirectly to the concept of fear of flying without specifically applying it to the existing situation This resulted in a vehement denial of such a feeling by the pilot and the assertion that he would show them all and do his share and more He performed well in subsequent missions repressing his fear and rechannelizing his hostility This hostility which at first produced a negative attitude (in effect I won t fly for you") was later used to stimulate his performance in combat The underlying feeling then was You say I m afraid Well now I ll show you that I m not

Comment This type of indirect challenge can be effective but should be used discriminatingly and only when the patient has sufficient ego strength to withstand it A safer and more generally applicable approach is the frank discussion of the physical and emotional effects of anxiety its occurrence as a normal reaction to marked stress and its value in maintaining the alertness of the pilot Great emphasis has always been placed by military authorities on the value of courage and the undesirability of fear It is important for the flight surgeon to help to remove the stigma of cowardice and thus alleviate the strong guilt feelings that generally accompany these fear reactions

EXTERNAL STRESS DURING COMBAT TOUR

The effects of undue external stress during a tour of combat duty include the most difficult group of conditions to treat The external stress is most frequently directly or indirectly a result of combat and may involve either the patient or other members of his unit Personality difficulties are predisposing factors, but the disabling psychiatric symptoms are related to and frequently precipitated by a particular accident injury or series of harrowing experiences

Case 3 A 24 year old navigator manifested signs of moderate anxiety during his B 26 night missions He had done some reading in psychology and at times attempted to discuss his difficulties in technical terms During his sixth mission, his plane received moderate damage from enemy fire He was visibly shaken up but continued to fly After returning from his next mission which was particularly difficult he awakened his flight surgeon at 0330 hours He was markedly agitated and said that he had just curled up in a fetal position and urinated in his bed He was feeling extremely disturbed, could not sleep and feared that he was going crazy e expressed the belief that some disease was eating out his brain " and presented the findings of an acute psychotic reaction The flight surgeon reassured him and sedated him heavily On the following morning he had improved dramatically and showed only mild anxiety In a few days he was medically cleared to fly At the time of writing he had completed 22 missions was getting along well and had received a commendation

Comment In this case the flight surgeon made a diagnosis of acute dissociative reaction rather than that of psychosis The general findings, including acute onset, severe symptoms, and quick recovery, resembled those of patients with acute anxiety seen during infantry combat This patient probably had some underlying schizoid traits and the situation was further complicated by his reading psychologic literature Had he been grounded for a longer period, it is likely that a more structured neurotic or fear pattern would have developed It is not always possible to return patients of this type to flying duty but it is important to make an early decision with the help of a psychiatric consultation, if indicated

Case 4 A 29 year old married jet pilot flew 35 fighter bomber missions during a period when his unit was undergoing significant casualties Two of his close friends were lost within a brief period, one while flying a mission with him Immediately after this he began to experience great anxiety in the form of insomnia loss of weight, and anorexia He became sullen, kept to himself, and decided to request administrative relief on the basis of fear of flying During the period while he was weighing this decision, he became increasingly tense and seclusive While on a short leave of absence, he contracted gonorrhea He felt extreme guilt and cried bitterly when he came to the flight surgeon for treatment He had previously been considered a superior pilot and a mature, intelligent person who was extremely popular in his squadron When he requested grounding, he felt greatly relieved and his symptoms of anxiety disappeared He became clinically well but would no longer go near his airplane He felt that any administrative action taken against him would be preferable to flying again

Comment This type of reaction, with predominant feelings of anxiety and guilt following the loss of a person with whom the patient has had either a dependent or ambivalent relationship, is commonly encountered in ground fighting Symptoms were present as long as the conflict existed between his group loyalties and his developing fear of combat flying and abated once this was resolved by his decision to quit

Case 5 A 27 year old jet pilot had a major aircraft accident not directly attributable to enemy action while on a fighter bomber combat tour He sustained only minor injuries but was shaken up by the incident He was extremely anxious to get back into combat His request was soon granted but it was noted that his previous calm was now replaced by a markedly aggressive attitude toward the enemy

Comment His exaggerated desire to get back into combat

were attempts to cloak his anxiety and fear As the flight surgeon aptly said It was like a man who had been thrown from a horse insisting that he get back on There was a tacit recognition by the flight surgeon (and perhaps unconsciously by the patient) that if he had not resumed flying immediately he might never have been able to have done so He was able to perform well on subsequent missions, and prolonged grounding might have been harmful

In Korea, our experience has been that enforced idleness is an external factor much more damaging to morale than enemy activity This may occur because of bad weather or when more pilots than planes are available Most pilots are anxious to complete their missions and get home quickly When grounded by poor flying weather for any length of time they fear loss of their sharp edge" and fear getting stale The flight surgeon is powerless to influence these factors but should be on the lookout for beginning evidence of emotional disorders during these periods

EMOTIONAL TENSION DURING FINAL MISSIONS

Mild to moderate nervousness irritability, or increased drinking in the course of the final 10 or 15 missions are almost universal occurrences but rarely cause clinical concern Behavior may range from mild unsteadiness to near psychosis during a period which officially begins when a flier receives his orders to rotate from the combat zone but signs may appear a month or more preceding this The condition represents a combination of elation at the imminent prospect of getting away from an unpleasant situation the unrestrained joy of returning home and the feeling that something may happen at the last minute to prevent its realization This reaction is understandably intensified in the combat pilot who fears specifically that he will be shot down during one of his final missions The policy of requiring the completion of a definite number of missions is the all important factor which enables him to get through this difficult period

Case 6 A 28 year old B 26 pilot successfully completed 52 missions without serious incident and was designated for rotation within 30 days Although according to existing unofficial policy he did not anticipate flying any more missions a directive was issued requiring all combat fliers to complete 55 missions before leaving the theater He became markedly anxious and depressed had frequent crying spells and insisted that he was unable to fly any He was finally permitted to rotate without being forced to do so

Comment When these late untoward reactions occur in either form commanding officers usually take cognizance of the amount of combat already completed and flight surgeons are apt to re-

cess in their attempts to have a pilot rotated from the

DISCUSSION

ierally unrecognized factor in the prerotation jitters, ıny experience, is the reluctance to leave Korea Among re sometimes develops such satisfying group identities, it of their work and, in some cases, freedom from family ɔility, that anxiety and conflict are experienced at the of returning to problems left behind These may be fac he occasional flier who extends his tour to fly additional

se case histories the symptoms observed in most pa all 3 groups are either of the anxiety or phobic variety, natic preoccupation The phobic symptoms often express ıtic reversal of a pilot s feeling toward his plane from that t sensual love to complete fear and the need for avoid

One of the emotional satisfactions derived from flying eeling of power and omnipotence it affords A related m in combat is used to deny anxiety, and is expressed by hing can happen to-me attitude Frequently identifica ı a friend who has been shot down occurs in response , and the complete reversal occurs as the feeling that ısaster must happen to me " Once this phobia has fully d, it is extremely difficult to induce a crew member to ying

y is quickly diminished when the patient is relieved from lying *(2)* but he is rarely able again to become an ef ɒilot We have observed in Korea virtually none of the ases described in World War II with the occurrence of overwhelming phobias and sustained regressed behavior ɜ that the profound reactions previously encountered re he more prolonged missions, greater resistance by enemy and flak and heavier personnel losses The most satis esults can be obtained from early recognition and treat these problems before they become full blown and in ting This task falls within the province of the unit urgeon who is most closely associated with fliers in living No single technic can be universally applied, and hasis must always be on the most effective approach to ɔnt I believe however, that an alert flight surgeon can be tive as a consulting psychiatrist He is sometimes in a ɔsition to achieve results because of his standing in the ı In the more severe cases, no therapy is efficacious

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Mild to moderate nervousness irritability or increased drinking in the final 10 or 15 missions are almost universal occurrences that rarely cause clinical concern Behavior may range from readiness to near psychosis during a period which officially begins when a flier receives his orders to rotate from the combat zone but signs may appear a month or more preceding this The condition represents a combination of elation at the imminent prospect of getting away from an unpleasant situation the unrestrained joy of returning home and the feeling that something may happen at the last minute to prevent its realization This reaction is understandably intensified in the combat pilot who fears specifically that he will be shot down during one of his final missions The policy of requiring the completion of a definite number of missions is the all important factor which enables him to get through this difficult period

Case 6 A 28 year old B 26 pilot successfully completed 53 missions without serious incident and was designated for rotation within 30 days Although according to existing unofficial policy he did not anticipate flying any more missions a directive was issued requiring all combat fliers to complete 55 missions before leaving the theater He became markedly anxious and depressed had frequent crying spells and insisted that he was unable to fly any He was finally permitted to rotate without being forced to do so

Comment When these late untoward reactions occur in severe form commanding officers usually take cognizance of the amount of combat already completed and flight surgeons are apt to meet

PAINLESS MYOCARDIAL INFARCTION

FRED B ROGERS *Lieutenant junior grade* MC USNR (1)

AMONG the earliest clinically recognized cases of myocardial infarction, the presence of intense, persistent, substernal or epigastric pain was considered to be a typical feature More recent observations, however, have shown that this type of pain may be simulated by other acute disorders, and also that acute infarction of the myocardium may occur without pain in a limited number of patients In this latter atypical group, other related symptoms suggesting cardiorespiratory failure, cerebral disturbance, or gastrointestinal upset usually predominate The number of such cases labeled as painless, silent, or atypical cardiac infarction encountered has depended somewhat on the definition of the term painless as well as on the care taken in eliciting the patient s history Sensations reported as "substernal discomfort" or "precordial distress," although mild or vaguely described, often have not been considered as actual pain In spite of the established fact that painless cardiac infarction occurs, some uncertainty as to the cause and incidence of this condition remains

The first comprehensive work on this subject in America was published by Herrick (2) In more recent studies, attempts have been made to determine the relative frequency of painless and painful attacks The varying incidence of painless cases as reported in the literature from 1940 to date is summarized in Table 1

Several hypotheses have been offered to explain the occurrence of myocardial infarction without pain Blumgart et al (15) demonstrated by clinical and pathological studies that the presence or absence of cardiac pain and myocardial damage depends on the development of sufficient collateral circulation to keep pace with coronary artery narrowing Dye injection studies in cadavers showed that about one third of those over 40 years of age at the time of death had a complete occlusion or

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(1) U S Naval Hospital National Naval Medical Center Bethesda Md at time of writing now with Military Sea Transportation Service Atlantic Area Brooklyn N Y

(2) Herrick J B Clinical features of sudden obstruction of the coronary arteries J A M A 59 2015-2017 Dec 1912

TA tud e o my d l fa t n

A thor	Y ar	Numb f at ent	P c t w th t p	R m k
P ll d nd H rv ll (3)	1940	375	8 5	F ur pe e t f th p l gr p w ot p s t for far t n by ECC
Stroud d W g (4)	1941	49	26 5	Cl n op th l g tudy
L d Ros ba m (5)	1941	208	3 0	
Stroud nd Wagn (6)	1942	100	15 0	The p t t not ported in (4)
B d Fr k l (7)	1944	378	10 0	Cl n l tudy ov 12 y ar pe od
K g l (8)	1945	350	2 9	
F h d Z k m (9)	1946	108	14 8	
Ch mb s (10)	1946	100	21 0	
M tz nd K tz (11)	1947	572	3 2	Of th 18 p t e ts with ut pa 5 d ed
La dma et al (12)	1949	255	11 0	Of th 28 ympt mat p tie t 15 h d c t nd 13 li lly old f ct
Behrm t al (13)	1950	150	7 3	All 11 f th p t nts w th ut p in d d
War t (14)	1951	200	7 5	Of th e 15 p t s 7 h d o p n d 8 h d typ l ymp- t m
Pr udy	1952	136	7 3	

marked narrowing of one or more major coronary arteries This oc curred despite their apparent freedom from cardiac pain during life The site and relative importance of the vessel or vessels oc cluded and the rate and extent of development of the resulting injury were also important modifying factors in the production of pain White *(16)* asserted that "if coronary narrowing and obstruc tion and even cardiac infarction develop slowly * * * there may be no symptoms at all though there be extensive areas of damaged muscle and though one or both coronary arteries be occluded "

Levy *(17)* suggested that symptoms other than pain in cardiac infarction may be "pain equivalents " In this instance the sympathetic C fibers may be abnormal in their response to stimulation by anoxia Other possibilities include the presence of an atypical coronary innervation or the alteration of a regular nervous distribution by disease so that normal response does not occur Herrick *(18)* plausibly summed up this occasional absence of pain by suggesting that (1) certain areas of the heart might be less sensitive to pain than others and, (2) a gradual arterial

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(3) P llard H M and Harvill T H Pai l ss myoca dial infarct n Am J M Sc 199 628-635 May 1940

(4) Str ud W D and W gner J A Silent or atyp cal coronary occlus on An Int Med 15 25-32 July 1941

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(6) Str ud W D and Wagner J A P inl myoc rdial nfa ctio P sylvan M J 45 590-593 Mar 1942

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(16) Wh t P D H art D se e 3d ed t on Macmilla Co New York N Y 1944 p 487

(17) Levy R L Th Diagno nd T tment of Ca diova cular D e se F A Da s Co Ph l d lphia Pa 1940 p 431

(18) H rr k J B Cor nary arte y t be lth and disea (Harvey le tur). Am. Heart J 6 589-607 June 1931

narrowing by sclerosis possibly caused anesthesia in the region it supplied by slowly destroying local blood vessels nerves and muscular tissue Following the latter event, a final complete obstruction could occur without a sudden shock—the heart being somewhat prepared beforehand for the ensuing infarction

ANALYSIS OF SERIES

The present study was made to determine the incidence of painless cardiac infarction at the U S Naval Hospital Bethesda Md in the past 5 years All clinical records for this period in which infarction of the myocardium appeared among the final diagnoses were reviewed This series was limited however, to patients in whom acute infarction had occurred Such diagnoses were established from the clinical histories serial ECG s and available necropsy material

TABLE 2 *I denc f sympt ms 10 pat nt w th p l s f t*

Sympt m	*N mb f p t t*
Ge l z d w kn	4
Dy p Mild (3) Se (2)	5
P lp t t (hythm)	3
Abd m l d mfort	2
Sy pe	2
N s	1
V g	1

In m nsta 2 m f th bo ymp m oe d in l p t

This study includes 136 patients with definite myocardial infarction 10 of whom had no definite anginal pain The average age of these atypical patients was 51 years The incidence of prominent symptoms in the 10 patients is shown in table 2 and other data on these patients are shown in table 3

In the 126 patients in whom pain was a prominent symptom, there were 37 deaths Necropsy was performed on 27 The average age was 55 years (range 2o to 81) The sex distribution was 111 men and 15 women Nine of the total number were Negroes Forty two gave a history of hypertension The location of infarction was anterior anterolateral or anteroseptal in 81 posterior posterolateral or posteroseptal in 40 and combined anterior posterior in 5 patients

TABLE 3 *Summary of records of 10 patients with painless myocardial infarction*

Patient	Age (years)	Sex	Race	Related disease	Chief symptom	Location of infarction	Surgical	Necropsy
1	37	M	W	Thromboangiitis obliterans of 1 year duration	No referable to infarction	Anterior	+	−
2	41	M	W	Subacute bacterial endocarditis 2 yr earlier with recovery	Weakness dyspnea and palpitation	Anterior	+	−
3	41	M	W		*Vertigo* and syncope	Anterior	+	−
4	46	M	W		Weakness and muscular aching in arms	Posterior	+	−
5	46	M	W		Nervousness and discomfort in upper chest	Antero-lateral	+	−
6	52	M	N	Hypertension of 12 year duration and arteriosclerotic cardiovascular disease with congestive heart failure	Dyspnea and orthopnea	*Anterior*	−	−
7	60	M	W		Lower abdominal discomfort	Anteroseptal	+	−
8	60	M	W	Diabetes mellitus of 10-year duration	Dyspnea	Anterior	−	−
9	67	M	W	Thrombophlebitis (femoral)	Weakness dyspnea syncope and palpitation	Posterior	+	+
10	72	M	W	*Hypertension* of 7 year duration cerebrovascular accident and hemiparesis	Weakness dyspnea nausea and abdominal discomfort	Posterior	+	−

On comparing those in whom pain was present with those in whom pain was absent no marked discrepancies were evident between the groups as to age, sex, race, location of infarction complications or mortality while in the hospital Precipitating factors and seasonal incidence likewise did not vary widely The presence of diseases predisposing the patient to cardiovascular damage appeared somewhat more frequent, however in the group without pain

DISCUSSION

A comparison of the incidence of painless infarctions in the present study with that of other *recent* reports shows a close correlation (table 1) Boas and Boas *(19)* stated that if one includes the lesser forms of distress such as mild constriction or uneasiness of the chest as manifestations of pain, and it seems logical to do so it is found that myocardial infarction is unaccompanied by pain in at most 5 10 percent of cases It is probable that cases without pain often have escaped detection or have been misdiagnosed in the past The increasing number reported in recent years has been proportional to an augmented interest in their detection From a therapeutic standpoint it is important to recognize these painless cases Blumgart *(20)* has summarized their clinical findings as follows In approximately 10 percent of attacks of acute myocardial infarction pain is absent Intense or moderate dyspnea weakness and occasionally, acute pulmonary edema occupy the foreground of the clinical picture In some persons who experience no cardiac pain the onset is signalled by syncope and collapse Acute myocardial infarction may develop without being evidenced by pain in any patient in whom the sensorium is clouded by diabetic coma uremia advanced congestive failure or hemiplegia In such instances unexplained fever leukocytosis the onset of dyspnea or cardiac irregularity may provide the clue and lead to electrocardiographic studies to confirm the diagnosis "

Vague clinical findings or objective evidence of cardiac infarction other than pain should cause the physician to suspect this possibility Bed rest should be prescribed and serial ECG s obtained in all such patients By early recognition and adequate treatment morbidity and mortality in these patients may be significantly reduced

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(20) Blumgart H L Diseases of the coronary arteries In Cecil R L and Loeb R F (editors) A Textbook of Medicine 8th ed W B Saunders Co Philadelphia Pa 1951 p 1138

CONCLUSIONS

Pain is absent in from 5 to 10 percent of all patients with myocardial infarction Other symptoms such as dyspnea and weakness may appear in lieu of pain Patients with painless infarction have a high incidence of disorders contributory to, or complicating, coronary heart disease The early recognition and proper treatment of these patients is important

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Familial Nonreaginic Food Allergy by *Arthur F Coca* M D Oradell N J with contributions by *Conrad Berens* M D New York N Y *Edith L Cumming* Valley Cottage N Y *Louis J Gerard* M D New York N Y *Leonard S Green* L L B New York N Y *Alan Johnston* M D Plainfield Ind *Arthur P Locke* Ph D New Brunswick N J *Milo G Meyer* M D Michigan City Ind *Murray Peshkin* M D New York N Y and *Sumner Price* M D Honolulu T H 3d edition 279 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $10 50

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The Anatomy of the Nervous System Its Development and Anatomical Relations by *Stephen Walter Ranson* M D Ph D Late Professor and Director of Neurological Institute Northwestern University Medical School Chicago Ill Revised by *Samuel R Hopkins* Ph D Professor of Anatomy Vanderbilt University School of Medicine Nashville 9th edition 581 pages illustrated W B Saunders Co Philadelphia Pa publishers 1953

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THE BACTERIOLOGIC DIAGNOSIS OF ENTERIC INFECTIONS[1][2]

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ENTERIC infections are a continuing and often a major problem in the Armed Forces They may involve our own troops, particularly in countries where enteric infections are highly endemic Outbreaks in units of the Pacific Fleet have been disturbingly common Furthermore, the responsibility of our medical services extends to prisoners of war, civilian refugees, and, at times, to entire civilian populations Allied troops of other nationalities whose medical facilities are less adequate may need assistance Thus the bacteriologic diagnosis of enteric infections is of great importance in Armed Forces laboratories

The best diagnostic facilities for enteric infections are those which are readily available, are capable of handling large numbers of examinations and can provide dependable findings as quickly as possible Large central diagnostic laboratories ordinarily cannot meet these requirements The outbreak and the need is usually far removed from them In the interest of effective control, the initial work must be done in the smaller laboratories which are close to the problem An expert bacteriologist is rarely available in such a laboratory and the work falls necessarily to technicians

Reference texts and monographs cover exhaustively those aspects of the bacteriology of the enteric pathogens which are of particular interest to senior workers We are offering, here an out-

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(1) This study has been reported was conducted in Korea by a Joint Dysentery Unit under the sponsorship of the Commission on Enteric Infections of the Armed Forces Epidemiological Board Those participating in the study in Korea were from the Army Medical Service Graduate School the Fleet Epidemic Disease Control Unit No. 1 the Microbiological Institute and Communicable Disease Center of the U. S. Public Health Service the 406th (U S Army) Medical Laboratory the 64th Field Hospital the Bureau of Laboratories of the Florida State Board of Health and the State University School of Medicine

(2) Methodology and statistical techniques were supported by a grant from the Office of Naval Research

(3) Director of Laboratories Florida State Board of Health

(4) 406th Medical General Laboratory

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line of technics designed to serve as a practical guide for studies in the field, for smaller laboratories and for workers of more limited experience with these organisms The technics described were evolved in part through comparative studies in a Public Health Laboratory and in part through experience in the study and control of an extensive outbreak of enteric infections in Korea Alternative procedures are available but we describe only the technics believed best for other than widely experienced bacteriologists

THE SPECIMENS

Shipped fecal specimens can be considered as satisfactory only in examinations for salmonella infections There is no preserving fluid or shipping medium which will provide dependable findings for shigellosis Cultures for these must be made on fresh specimens These may be obtained as follows

Passed specimens In hospital practice the patient may be provided with a sterile bedpan or an appropriate substitute (locally manufactured small tin hand washbasins were used in Korea) The whole specimen should be taken to the laboratory immediately and should be cultured *within minutes* of passage With delay the findings become progressively less reliable

Rectal swabs The materials used for this technic consist of latex rubber tubing (0 5 cm inside and 0 8 cm outside diameter) cut into 10 cm lengths with a 1 cm bevel at one end and cotton tipped applicators (with the cotton wound tightly and completely covering the tip) The latter must pass easily through the rubber tube After sterilization the swab is placed in the rubber tube with the cotton tip about 0 5 cm proximal to the opening of the beveled end The external surface of the terminal tip of the tube is lubricated with a sterile nonbacteriostatic lubricant Care is taken to prevent the lubricating jelly from reaching the swab or covering the opening The ambulatory patient is instructed to bend over and hold the buttocks apart With the patient in this position the unit is inserted about 6 cm The end of the swab is exposed by withdrawing the tube 2 or 3 cm To collect the specimen the swab is rotated as the tube is swept in a circular motion The tube and swab are then removed and separated The swab is used for direct inoculation of plates and enrichment as described The tubes are boiled and washed then resterilized for future use

The only purpose of the lubricated rubber tube is to facilitate the insertion of the cotton tipped swab well beyond the anal sphincter In the young the sphincter is very relaxed and the swab alone is satisfactory for infants In adults the swab without the rubber may be used with the exercise of extra care on the part of the person taking the specimens and after some practice

The buttocks must be held widely apart, exposing and partly opening the anus The swab is inserted with gentle pressure and simultaneous rotation The material for culture is collected as above On withdrawing, rotation in the same direction is continued, thus avoiding the unwinding of the cotton and loss of the swab Mastery of this technic saves the labor of preparing, washing, and sterilizing the rubber tubes

The major advantage of the rectal swab technic is that specimens may be obtained as desired Two workers can culture from 100 to 150 persons per hour The men line up, drop their trousers, bend over, and hold the buttocks apart One worker takes the swabs and hands them to a second who inoculates prenumbered plates An assistant records the names and corresponding laboratory numbers

Sigmoidoscopic swabs Sigmoidoscopic examinations, when performed, permit collection of swabs from areas of maximum involvement in the lower bowel Material from this source, if it can be obtained, is somewhat superior for culture purposes

If it is necessary to submit *specimens by mail* (or courier), a 1 ounce screw capped bottle, half filled with a 30 percent buffered glycerine saline solution, is satisfactory only for the diagnosis of *Salmonella typhosa* and other salmonella infections

The relative reliability of cultures for shigella on freshly passed feces, material collected by rectal swab, and that obtained at sigmoidoscopic examination has been evaluated and the findings reported *(6)* The latter yielded about 6 positive cultures as compared with 5 obtained from freshly passed feces Material collected by rectal swabs gave a few more positives than the cultures on passed specimens On the basis of convenience and reliability the rectal swab technic may be used with confidence

MEDIA FOR PLATING AND ENRICHMENT

Select the best media and use the least number of plates that will give dependable results The media recommended include

Shigella salmonella agar (SS) This is the most valuable and reliable single plating medium available for enteric cultures All common shigella, all salmonella the paracolons, and also a variety of organisms which are generally considered nonpathogens, such as pseudomonas, proteus and alcaligenes, grow well on this medium It may inhibit some rarely occurring strains such as *Shigella dysenteriae* (Shiga)

(6) Hardy A V Mackel D F D and Hamrick D R Laboratory diagnosis of [illegible]

MacConkey s or *desoxycholate agar* may be used as additional plating media for the isolation of shigella which do not grow on SS agar They are less selective than SS There is limited need for these as initial plating media, but their use is indicated when plating cultures for purity

Wilson Blair s bismuth sulfite agar (WB) is highly selective for salmonella and has outstanding value for the isolation of *S typhosa* Its use is indicated in a search for typhoid cases or carriers

Kauffmann s *brilliant green agar* (BG) is also highly selective for most salmonella other than *S typhosa* and *Salmonella para typhi A*

Enrichment broth for salmonella Tetrathionate and selenite F are both recommended Most workers add brilliant green to the tetrathionate (1 ml of a 1 1000 solution per 100 ml medium). The selenite F in dehydrated form may deteriorate When prepared it should be a light straw color if amber discard The inoculated enrichment broth is incubated for about 18 hours subcultures are transferred to SS or to the more highly selective media (WB or BG) mentioned above

These media and the differential Kligler s iron agar (KIA) referred to below are all available in dehydrated form Prepare according to directions The addition of 1 percent sucrose to the KIA will provide a triple sugar medium and is recommended Dehydrated media are satisfactory to use if in the bottle they are finely granular When caked into a firm mass they may produce irregular results and should be discarded

Select media according to needs SS alone is indicated as the plating medium for most cases or outbreaks of shigellosis If the nature of the outbreak or the probable diagnosis of the patient is not known plate directly to SS and inoculate an enrichment broth If typhoid is suspected plate to WB also It is sound practice to use multiple media in a situation of unknown nature and to continue to use only those which yield a substantially higher number of positives than the others

PLATING OF SPECIMENS

Direct inoculation of all plates is done with swabs With fresh whole fecal specimens a sterile swab is dipped into the mucopurulent exudate if any is present or into the feces if there is no exudate Specimens in glycerin and saline are shaken gently and the fresh swab is dipped into the mixture

The swab obtained by any of the methods described is used to inoculate an SS plate About half of the surface is streaked by a to-and fro motion Completely cover the area Do not zigzag The

same swab may then be dropped into a tube (125 by 15 mm) of enrichment broth The inoculation of the SS plate is completed by using a second sterile swab, cross streaking over the inoculated area, and simultaneously streaking an uninoculated quarter of the plate The final quarter is inoculated, using the same swab, but without cross streaking The amount of inoculum can be regulated to a degree If the original swab is very heavily coated with feces, streak only one-quarter or even one-eighth of the plate with it, likewise reduce the cross streaking, leaving a major part of the plate as the final lightly streaked quadrant In some geographic regions it is found satisfactory to streak the whole plate with the original swab It is ordinarily safe to do this when the swab has little or no gross fecal material In the Korean epidemic the plates had to be inoculated lightly to avoid undesirably heavy growth, light inoculation is always necessary if the specimen is from an infant

Only by inspecting the plate can it be ascertained if, in general, the inoculum needs to be lighter or could be heavier Remember that areas of the plate too heavily or too lightly inoculated are almost valueless In some geographic areas, even when the plate is inoculated heavily, virtually no growth on SS occurs on negative specimens Attention to the technic of plating is required if a high percentage of all plates are to be considered as satisfactory

If there is clinical or epidemiologic reason for suspecting *S typhosa* infection in the persons being cultured, an initial plate of bismuth sulfite agar may be inoculated This may be done as a streak or a pour plate For the former, the surface of the prepared plate of medium is heavily streaked with the original swab The pour plate is inoculated by first preparing a very cloudy fecal suspension in about 0 5 ml of saline solution Pour this in a sterile Petri plate Add about 15 ml of melted WB cooled to about 45 C and gently rotate the plate to mix the inoculum and the agar before the latter solidifies This method of inoculation is time consuming and should be considered as a special test which is particularly effective for *S typhosa*

An SS plate (also WB or BG if indicated) is inoculated from the enrichment broth after overnight incubation A drop of the broth is transferred to the surface of the agar plate by a loop (5 or 6 mm inside diameter) and prepared from about 22 gage nichrome wire Streak by quadrants to provide areas with heavy, medium, and light inoculation

The SS is incubated for from 20 to 24 hours at 37 C , the WB for 48 hours Plates of the former with any suspected colonies may be held at room temperature for re examination on the following day It is desirable to hold suspected WB plates at incubator temperature discarding them only after 72 hours

PICKING

The most important and the most difficult step in isolatin enteric pathogens is the picking of plates This is a job for the most dependable worker The Quebec colony counter provides a good quality of artificial light and the proper dark background Its use is recommended If unavailable a good source of day light or artificial light is essential Save time and energy by arranging conveniently the plates to be picked the uninoculated tubes racks for inoculated tubes and a place for plates to be discarded and for those to be saved *Take it an unbroken rule that plates will be picked in serial order* This is the best assurance against errors in numbering

There is no substitute for experience in learning the pickin of plates *The beginner must be encouraged to pick freely*—at least 2 of each type of suspected colony The colonies of coli form organisms which grow on SS are red The large, heavily opaque colorless colonies almost invariably are nonpathogens So too are the small watery clear ones The sticky colony which draws out in a thread and has a rubbery consistency is neither shigella nor salmonella Experienced technicians learn to recognize and pass these by In contrast the very suspicious looking colonies are the round translucent colorless colonies commonly about 2 mm in diameter and of a soft to fluid consistency The experienced worker must finally rely on the differential tube medium to separate the negative from the possibly positive colonies Even more so the less experienced technician must avoid making decisions on colony appearance alone It is sound practice, when time permits to identify the colonies picked by adding a letter to the specimen number and to keep notes on the colony appearance On the following morning the reaction on the differential medium may be compared with the type of colony described Skill in the picking of plates is acquired only by such critical personal observations

The characteristic *S typhosa* colonies on WB are jet black and have a sheen and a surrounding smoky halo If crowded the colonies may appear light green with dark green or black centers The *S paratyphi A* colonies are green or grey green sometimes with concentric rings of varying densities of color Other salmonella colonies usually are larger than those of *S typhosa* and are of a dark lustruous brown color

On the less selective media such as MacConkey s or de oxy cholate agar colorless colonies must be considered as possibly being enteric pathogens therefore they must be picked

On the surface of *all* selective media there are many viable organisms which have not grown There will be contaminating

organisms under the suspicious colony which is being picked To assure pure cultures, touch the center elevated surface only, particularly avoid a scooping motion in picking

READING OF KLIGLER'S DIFFERENTIAL MEDIUM

The suspected colonies are stabbed and streaked to KIA slants with 1 percent sucrose added It is both economical and satisfactory to tube this medium in 13 by 100-mm test tubes After from 18 to 24 hours' incubation, the inoculated tubes are examined, read, and separated according to reaction

The cultures with acid and gas (indicator change from red to yellow) as produced by *Escherichia coli* and *Aerobacter aerogenes* are considered negative and discarded Likewise, organisms which show no change or an alkaline reaction (a dark to purplish red) given by pseudomonas and alcaligenes strains are discarded Organisms producing an acid reaction without gas in KIA are usually enterococci and as such are negative It is advisable, however, to make a Gram stain before discarding these tubes If the organism is a gram negative rod, the possibility of *S typhosa* which occasionally gives this reaction, should be considered and the culture checked accordingly

Those cultures showing an alkaline (red) slant and acid (yellow) butt without gas must be considered as possible shigella or *S typhosa* Most, but not all, of the latter produce sufficient hydrogen sulfide to give a superficial darkening first appearing around the point of beginning of the stab The cultures which result in an alkaline slant and acid butt with gas may be salmonella Most but not all, salmonella, other than *S typhosa* and *S paratyphi A*, produce sufficient hydrogen sulfide to give a heavy blackening of the whole butt of KIA In both instances, these cultures must be differentiated from anaerogenic and aerogenic proteus and paracolon organisms that produce identical reactions on this medium

Thus, by the reactions on KIA, the possibly positive cultures are divided into those suspected of being shigella, *S typhosa*, or other nongas forming salmonella and those suspected of being the usual gas forming salmonella Although the same general steps in procedure are followed, certain variations in screening tests make it simpler to handle each group separately from this point

SCREENING TESTS

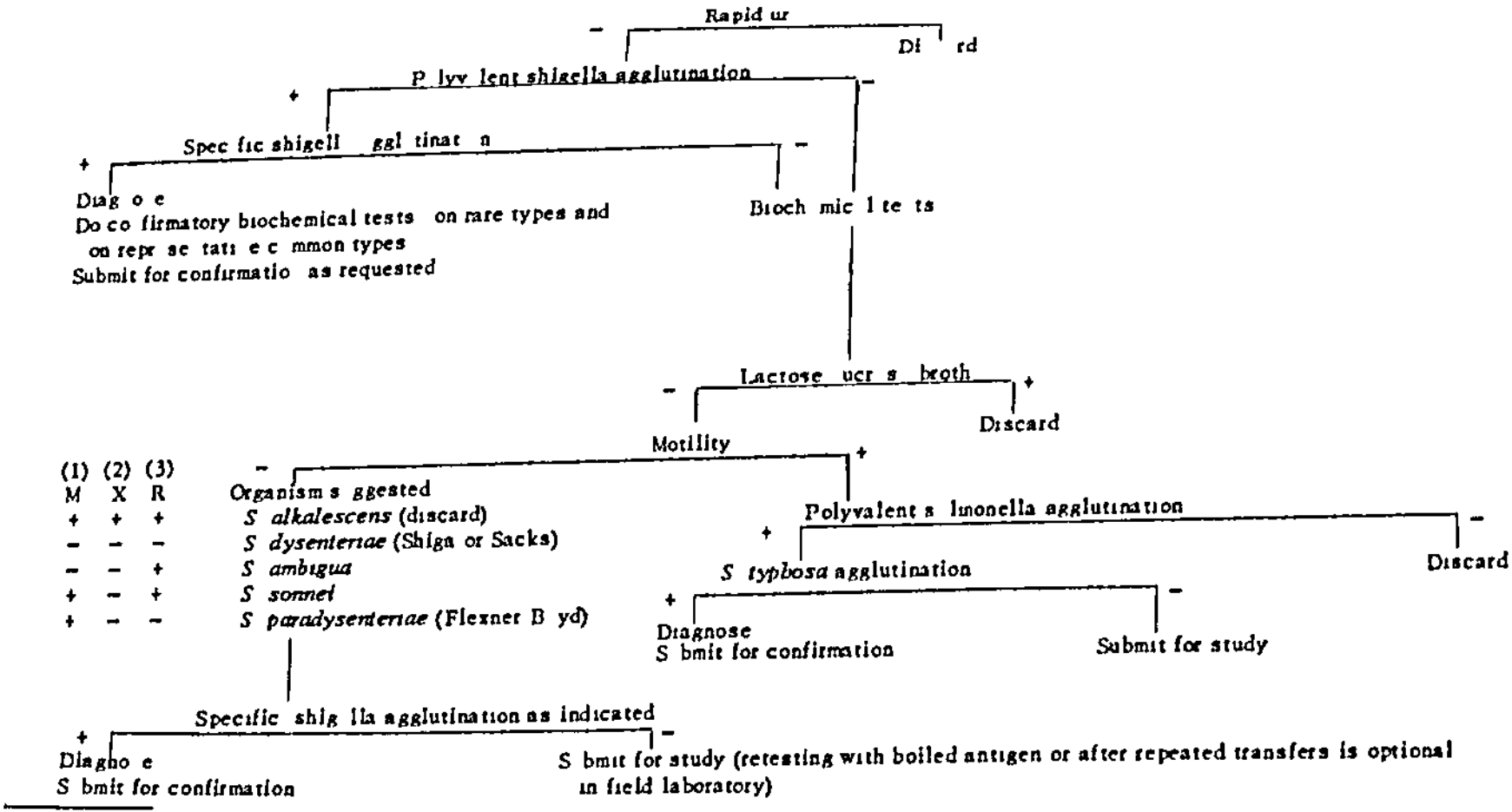
The isolation of enteric pathogens as described above must be done in laboratories close to the patient if findings are to be reliable for shigellosis The identification of isolated organisms may be done in laboratories far removed from the

What can be done in the field laboratory will depend on s equipment, reagents and personnel available Thus the p planning of screening tests involves a working agreement bet the small field and the large central or general laborat The details of planned procedures may vary widely and no outline of recommended screening tests is warranted The responsibilities of the small laboratory in addition to the i isolation are (1) to use appropriate screening tests which eliminate most of the "negative" organisms (2) to use s diagnostic tests which will provide the clinician with labor data of immediate value and (3) to send to the central labor all suspected or doubtful cultures properly labeled The ce laboratory must be responsible for the definitive identificat Its reports if they are to have any clinical interest or v must be returned without undue delay

The laboratory work involved in the study and contr diarrheal disease in the POW camp on Koje Do Korea i summer and fall of 1951, was done under military field condi Equipment and supplies had to be limited to the minimum e tials and even such items as incubators (or the electric operate them) glassware, media and diagnostic antisera not always available as needed Moreover, in this outbreak 300 to 500 enteric cultures were taken daily and from these positive or suspected organisms were isolated Necessity manded that the less productive procedures be omitted screening and diagnostic techniques used under these condi are described as illustrative

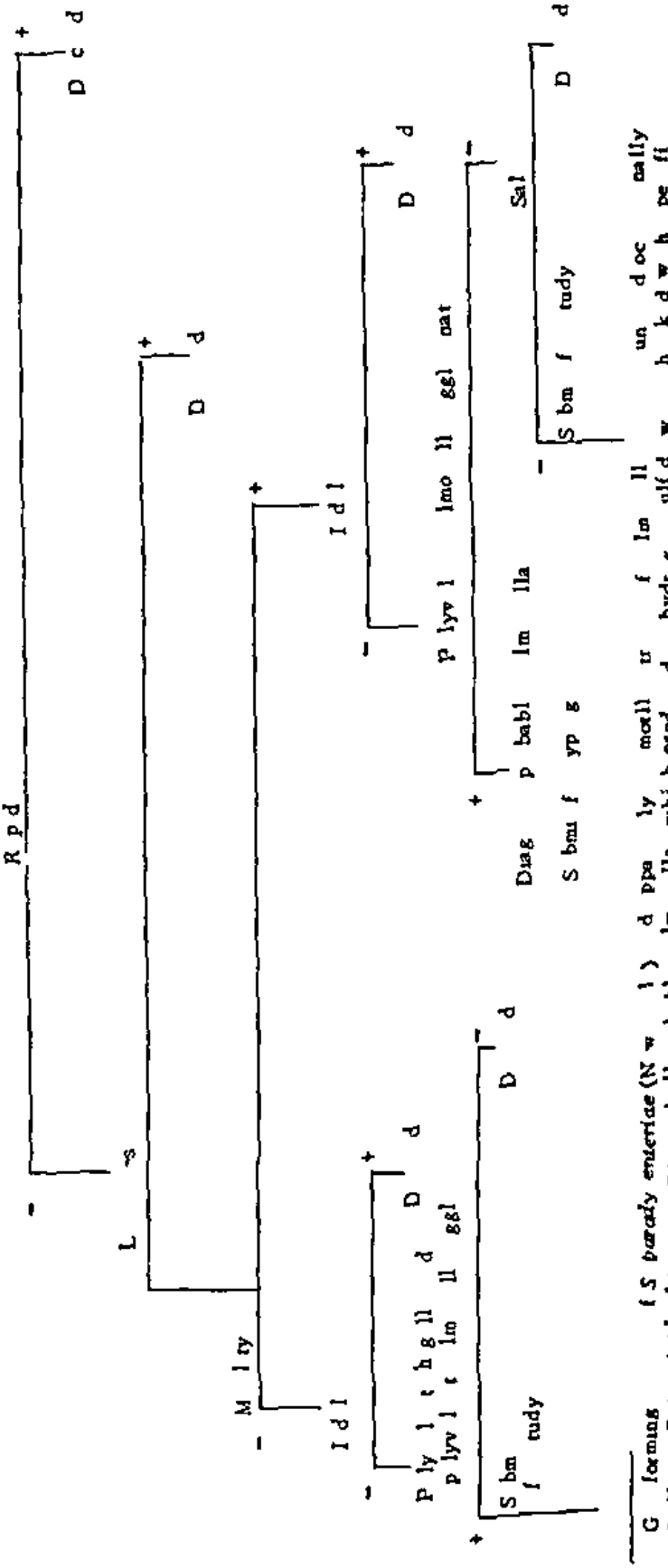
The procedures used in the field laboratory in Korea are s in figures 1 and 2 Judging the probable purity of a cultu a recurring problem We placed reliance on a careful pickin multiple colonies from the same plate Only when there gross evidence of contamination on the KIA slant was the cu replated for purity in the field laboratory Thus if the reac was one indicating a negative" organism the culture discarded if on inspection of the slant there was no sugges of contamination The replating of all or large numbers of cult for purity is not practicable for a field laboratory doin maximum amount of work with minimal equipment, supplies personnel

Proteus organisms were common in Korea and the detec of these by the rapid urease test was the first step in the amination of both the nongas formers and the gas formers urease reagent would ordinarily be provided from the cen laboratory or purchased in a concentrated solution The is simple, involving only mixing a heavy inoculum of gr in about 0 2 ml of reagent and incubating in a water bat



(1) Ma nitol (2) Xylo e (3) Rhamnose
These includ simultaneously inoculated lactos sucrose broth motility medium mann tol broth xylose broth and rhamnose broth

Figure 1 Procedures used in a field laboratory in Korea for the study of nongas forming enteric organisms



Figur 2 P oced re us d in a fie ld labora ory in Kor for be tudy of ga forming nteric organi ms.

37 5° C It is recommended that this test be read after 2 hours but, because there was very little change in the second hour, it was read by us after 1 hour in order to save time All cultures giving a positive (red) reaction were assumed to be proteus and, if on inspection of the KIA slant the culture appeared to be pure, these were discarded This simple procedure frequently eliminated half of the gas formers though ordinarily only a small proportion of the nongas formers Any urease positive cultures which appeared to be contaminated were held, plated for purity on MacConkey's agar, picked and transferred to KIA The subcultures are re examined beginning with the rapid urease test.

The second step in the examination of the nongas formers was agglutination in a polyvalent shigella antiserum Those available to us varied but that needed is one which contains antibodies for a high proportion of the pathogenic shigella occurring in the area in which the laboratory is located The slide agglutination technic was employed for this presumptive serologic test. A 1 inch by 3 inch glass slide was marked into 2 rows of 5 squares each A small drop of the polyvalent antiserum, diluted as directed for that particular lot, was placed on each square by droppers in the stoppers of the bottle Growth from a KIA slant was transferred by sterile inoculating needle and emulsified in the antiserum At least 5 tubes in succession were so handled and the slide was then rocked gently A clearly positive reaction within the time limit stated for the serum is a satisfactory basis for providing an early presumptive and fairly reliable report to the physician Ordinarily no further serologic tests would be performed in the field laboratory but in Korea typing with specific antiserums followed Confirmatory biochemical tests were done also on at least one isolation from each new case and on all rare types, but ordinarily this too was left to the central laboratory

The organisms giving the reaction of shigella on KIA but which were not positive in the polyvalent antiserum used were examined in 5 biochemical tests as indicated in figure 1 and table 1 The inoculation was done rapidly using a needle, first stabbing the motility medium and without returning to the KIA, dipping the needle in succession into the 4 broth tubes, The nonmotile, nongas forming organisms which did not ferment lactose or sucrose were divided by their 24 hour reactions in mannitol, xylose, and rhamnose into probable types of shigella as indicated All of those organisms require definitive study in the central laboratory but those giving the biochemical reactions of *Shigella paradysenteriae* (Flexner group), *Shigella sonnei*, or *Shigella ambigua* were usually found positive and reported as "organisms having the cultural characteristics" of the respective type Those failing to ferment any or fermenting all

of the 3 sugars were often found to be other than pathogenic shigella It is wise to delay any report on these In our study in Korea these were carried to final identification in the field laboratory The semisolid motility medium aided in picking out the possible *S typhosa* and, if the necessary antiserum is available as it was in Korea, there can be an early presumptive identification of this organism

TABLE 1 *Biochemical screening test (Reading are made after from 18 to 24 hour incubation)*

Motility (1)	Indol (2)	Lactose or Sucrose (3)	Mannitol (4)	Xylose (4)	Rhamnose (4)	Organism suggested
−	V	−	+	−	−	*S. paradysenteriae* (Flexner or Boyd)
−	−	−	+	−	+	*S. sonnei*
−	+	−	−	−	+	*S. ambigua* (Schmitz)
−	V	−	−	−		*S. dysenteriae* (Shiga or Stutzer)
−	+	−		+	+	*S. alkalescens*
	−	−	+	+( )	−	*S. typhosa*
V	V	+	V	V	V	Non pathogens

(1) Use gram stain mid motility test medium.
(2) Perform indole test on Salmonella-Shigella agar slant using Kovacs indol reagent.
(3) The following glucose medium as proposed by A C S and Army Medical Service Graduate School

Trypticase	20 grams
Dibasic sodium phosphate	1 gram
Sodium chloride	5 grams
Bromthymol purple (1 6 per cent)	0 5 ml
Distilled water	1 000 ml
Autoclave 15 lb for 15 min	Allow to cool and prepare
Lactose	10 ml (different concentration 10 percent)
Sucrose	10 ml (different concentration 10 percent)

We employed the method of preparation by adding gas production tube and sterilizing at 15 lb. for 15 min.

(4) Prepared from bromthymol purple base Comparable preparations with the following per cent of hydrolyzable V variable

The gasformers which were urease negative were tested in the lactose-sucrose broth and the semisolid motility medium Organisms which ferment the lactose and/or sucrose may be assumed to have no pathogenic significance and if appearing in pure culture may be discarded

All nonmotile organisms which were indole negative, were tested with polyvalent shigella antiserum (as a possible "Newcastle" strain) but if negative these were discarded The remaining motile indole negative, gas forming organisms were the possible salmonella and these were checked by slide agglutination with the polyvalent salmonella antiserum A presumptive positive report was submitted if they reacted If negative, they were checked with salicin and discarded if this was fermented Otherwise all organisms of this type must be carried to final identification in a central laboratory

The value of the combined lactose-sucrose broth warrants emphasis This was prepared according to the formula shown in table 1 It not only gives a rapid indication of lactose and/or sucrose fermentation but the same broth is used for the performance of a test for indole Sanders recommends picking directly from plates to this broth and transferring from that to KIA and other test media We have no experience with that procedure but did find the broth highly useful as we used it

ORGANIZATION OF LABORATORY WORK

Laboratories in the Armed Forces to meet their needs must be organized for volume work The time of a laboratory could be consumed readily by the detailed examination of a few enteric cultures, but a wise selection of technics may increase by many times the number of cases studied and the number of patients diagnosed by positive bacteriologic findings In this way the field laboratory can greatly increase its value to the preventive and clinical medical services

The major need in organizing bacteriologic laboratory service is a clear understanding and definition of the differing services of the small hospital or field laboratory and the large central or general laboratory Close co-operation between them is essential A critical attitude of superiority on the part of the central laboratory must be avoided It must be appreciated that the quality of the laboratory diagnosis, particularly of shigellosis, is determined by the small laboratories close to the patient, not by the large but distant laboratory It is the responsibility of the general laboratory to aid the local laboratory in every practicable manner, including a prompt identification of cultures sent for examination

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ELECTIVE INDUCTION OF LABOR

Using Oxytocin Injection Intravenously

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JOHN P ANCELL, Capt., MC, USA

INDUCTION of labor for such conditions as toxemia of pregnancy and premature separation of the placenta has been part of our armamentarium for many years. To this we would add the induction of labor under proper supervision for the patient's convenience if certain prerequisites are fulfilled. The drug of choice for this procedure is oxytocin injection (pitocin). Its use was first suggested by Page (1). Subsequently others have commented on its use in intrapartum inertia (2–5). There have also been several reports on its use in the induction of labor (6–9). These authors have generally commented on its relative safety under carefully controlled conditions. Most of these inductions were indicated by such maternal or fetal causes as premature rupture of membranes or dead fetus at term.

The obstetrical service of this hospital draws patients from a wide area. Some of them must travel more than 40 miles through heavy traffic. The risk of delivery en route for this group of patients, particularly for multiparas with a history of short labor, is great. These patients understandably worry about whether they can "beat the stork." If elective induction is used they may look forward to a leisurely drive to the hospital and a short easy labor.

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(1) Maj. Hugh E. Page, Army Hospital, Phoenixville, Pa.

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These patients are admitted to the hospital several days fore the expected date of confinement The exact dat of adm sion is determined by clinical evaluation from rectal vaginal abdominal examinations performed in the clinic during the l weeks of pregnancy On admission a sterile vaginal examinat is made to determine the status of the cervix It is essential the cervix to be ripe before any form of induction can be c sidered The following criteria are of the utmost importance dependable rather than haphazard results are to be obtained w this procedure In the primigravida, the fetal head must be gaged and the maternal pelvis ample The cervix should point the axis of the vagina be at least 70 percent effaced and admi finger In the multipara the ripe cervix will admit 2 fingers may be only 50 percent effaced If the cervix is ripe it ha distinctive elasticity but if it is unripe it is firm and n If the membranes can be easily ruptured this is done All pati with any cephalopelvic disproportion or with other than a ver presentation are excluded Grand multipara and patients with me cal or surgical diseases are not included

If the situation is favorable for the induction of labor the tient is given an enema and sedated with demerol and scop amine hydrobromide An intravenous infusion of 1 000 cc 5 percent dextrose in distilled water containing 1 cc of oxyto injection is then started at a rate of from 10 to 15 drops minute Constant observation by the obstetrician is essenti The nature of the contractions and the fetal heart tones are served repeatedly The rate of flow is adapted to the uter response and may be speeded to 30 or more drops per minu The first reaction to the drug is a general increase in the tone the uterine muscle This is most pronounced in patients in wh the membranes have been ruptured Should tetanic contracti or irregularities of the fetal heart occur the infusion is eit slowed or discontinued

If one infusion fails to induce labor it can be repeated on subsequent day often with success Lubin et al (6) reported peated infusions as a form of induction weeks from term

After labor is established, the infusion is discontinued in so of our patients but in others it is continued In several patie in whom the drip is discontinued we have found that labor desultory It is our impression that the continuation of the fusion markedly decreases the need for operative interferen other than the application of simple outlet forceps It is a helpful to promote contraction of the uterus following the livery of the placenta and thus decrease blood loss

Our results in a series of 100 patients have been most satisfactory. Twenty-eight of these patients were primigravidas (including 4 who had spontaneous rupture of the membranes prior to the onset of labor). The average duration of labor for the group was 6 hours and 50 minutes (range, 3 hours to 18 hours and 30 minutes). Thirty-five were multiparas in whom the membranes were artificially or spontaneously ruptured prior to the beginning of infusion. The average duration of their labor was 2 hours and 30 minutes (range, 1 to 7 hours). Thirty-seven were multiparas with unruptured membranes. The average duration of labor in this group was 3 hours and 30 minutes (range, 1 hour and 30 minutes to 6 hours and 30 minutes). This may be compared with Peckham's (*10*) large series in which the average duration of labor for white primigravidas was 16.57 hours and for white multiparas was 10.5 hours. There were no serious complications or fetal deaths in our series. Spontaneous deliveries were the rule. It must be remembered, however, that this was a highly selected group of healthy patients with impending labor and vertex presentations.

CONCLUSION

We believe that the elective induction of labor using a slow venous drip of dilute oxytocin injection is of definite value in the obstetrical clinic that serves patients from a wide area. Such patients must be carefully selected and the procedure carefully supervised.

(*10*) Peckham, C. H.: Age distribution of 15,370 obstetric patients and incidence of type of delivery. Am. J. Obst. & Gyn., 23: 635-642, May 1932.

clinical use of adrenal cortical hormones and ACTH The clinician will be especially interested in the last chapter and the investigator and endocrinologist will enjoy the whole book.

The last chapter includes (1) a practical discussion of the use of cortisone and ACTH in rheumatoid arthritis and adrenal and pituitary insufficiency (2) evidence that of the collagen disease hormonal therapy definitely benefits only periarteritis nodosa, and (3) an interesting discussion of compound B and active compound F —*Col F W Pruitt MC USA*

Psychiatric Aide Education by *Bernard H Hall* M D *Mary G* R N Little M *V L. N rr* A B *V enne Hut b s V l,* A B P A d *God S wat ky* A B P A Th report f e perm t co d t d by Th M n ng Foundati n i o- per t with The T peka Stat H p tal u der a gr t f om Th R ck f ll r Fou d t Topeka Ka Th M nni g Clin M g ph Series No 9 168 p ges Grune & Stratton I c N w York N Y publ sh rs 1952 Pri $5 75

This report describes (1) the thought and planning which preceded the establishment of the training program (2) experiences during the 3 years of the experiment, and (3) the evolution of the curriculum growing out of these experiences It will be of interest and value to anyone setting up or administering a program of psychiatric aid education

—*Commander M E Roudebush MC USN*

Acut P phe l Art r l Occlu on by *W ll m D H ld* M D Cl r H P y P of o f Surg y Ve t R U ers ty School of M d Dir t f Surg y U ty H p t ls of Cl land Cl l d Oh Ame c L tur S r s P bl c t on N 141 M g ph Ame n L tur s C l tio Ed d by Irvin R *P g* M D Cl l d Cl c Cl v la d Oh d A C. Comroe, M D Cle l d Cl Cl l nd Oh 66 pag s ill t t d Ch s C Th m Publ h Sp gf ld Ill 1952 P i $2 35

The purpose of this monogram appears to be to further stimulate the general surgeon s interest in the treatment of acute peripheral arterial occlusion The value of early diagnosis and treatment is stressed The cause hemodynamics clinical manifestations and the treatment of all types of occlusion are adequately but briefly outlined The book is recommended to all physicians and surgeons desiring a rapid review of the subject

—*Capt L G Bell MC USN*

RATES OF WOUND HEALING

When Standard and Experimental Burn Dressings Were Used

DANIEL S J CHOY Captain, USAF (MC) (1)

In a previous report (2), a new type of local therapy for burns was presented It consisted of a rapidly applied, sprayable, inert vinyl plastic (XC7 9C) and had inherent and obvious advantages over the standard pressure bandage method, especially with reference to thermal injuries of disaster proportions This article deals with a study of the comparative rates of wound healing when the plastic and the standard petrolatum dressings were used

Method Fourteen adult male and female albino rats, Sprague Dawley strain, weighing from 250 to 350 grams, were used Each animal was anesthetized with pentobarbital sodium given intraperitoneally, and shaved on both sides of the abdomen Both sides were painted with merthiolate A circle 1 cm in diameter was traced on both sides with a template The areas were then painted with merthiolate With surgically clean (but not aseptic) scissors and curved scissors the circular areas of skin were excised, exposing subcutaneous fascia The skin defects were placed on cellophane The plastic XC7 9C was applied with an applicator stick to the right wound and allowed to dry, leaving a transparent film about 0 002 inch thick Petrolatum was applied to the left wound A sterile 2- by 2 inch gauze dressing was placed over both wounds and kept in place with adhesive tape circumferentially

The wounds were inspected at 3 or 4-day intervals under anesthesia, and the defects recorded on cellophane by means of tracing (fig 1) At this time the dressings were changed Only in 3 or 4 instances when the plastic film was inadvertently removed due to adherence to the overlying gauze, was it necessary to reapply XC7 9C In the remainder, the original application of XC7 9C was adequate until complete healing had occurred

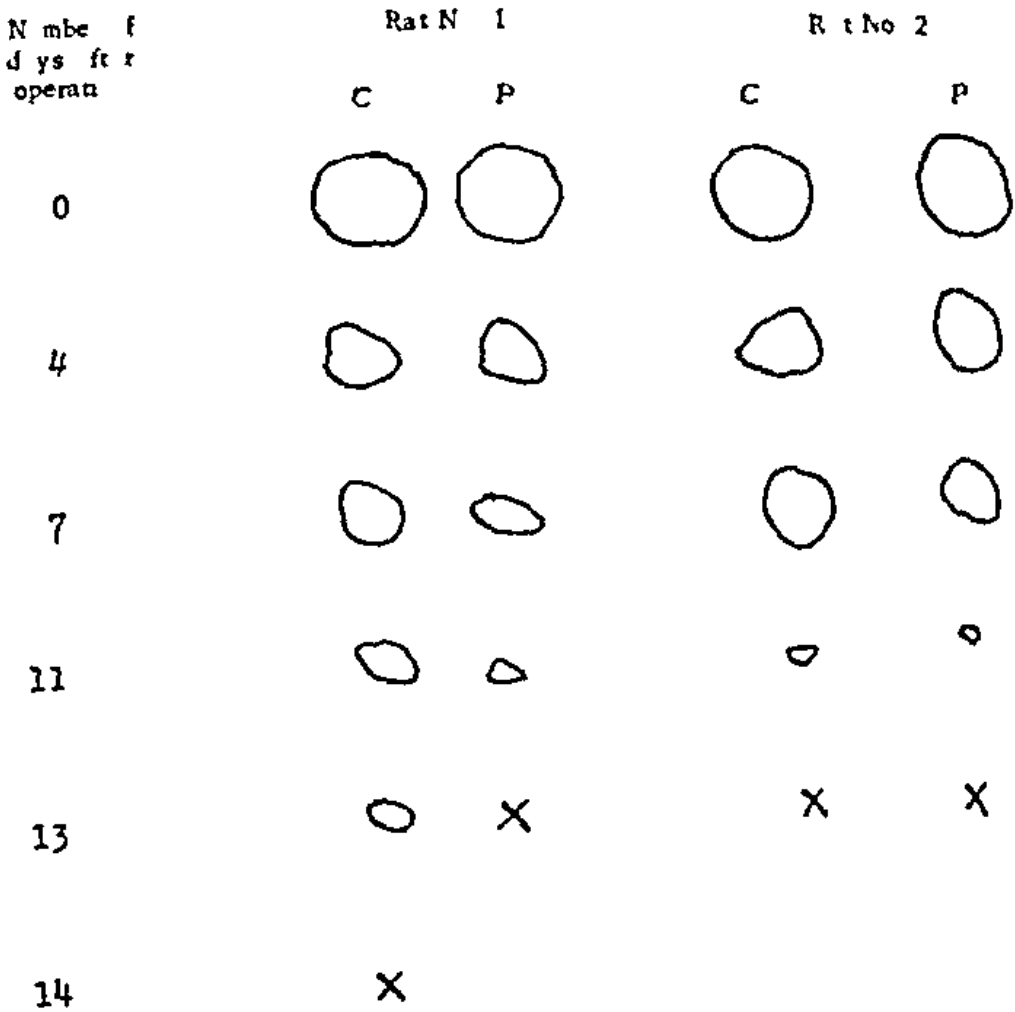
Results Healing times ranged from 13 to 14 days after the operation Of the wounds treated with petrolatum gauze, 5 healed in 13 days and 9 in 14 days Of the wounds treated with XC7 9C,

(1) Aero Medical Laboratory Wright Patterson Air Force Base Ohio

(2) Choy D S J and Wendt W E New local treatment of burns U S Armed Armed Force M J 3 1241 1255 Sept 1952

46 63 O— 3——

6 healed in 13 days and 8 in 14 days There was thus no signif icant difference in rates of wound healin, in this series of 14 comparisons



X C mplet h ling
C C trol
P Pla n

F gur 1 Repr s tat e t of u o nd be li g 2 t when the pl t c and cont l dr ss g ue e us d

DISCUSSION

A study by Brush et al *(3)* of a number of substances recom mended for the treatment of burns revealed that among those which delayed wound healing were tannic acid in solution and in jellies proflavine dihydrochloride sulfhydryl biodyne ointment and 2 types of carbowax base Wounds dressed with petrolatum

(3) Brush B E Lam, C. R nd P ka J L. W nd be l ng odie ve l b t nc mmended for tre e f burns Surge y 21 662 667 May 1947

of the International Poliomyelitis Congress to explore all pha es of current knowledge of the disease In 31 papers the charac teristics of the virus its transmissibility in human bein s and animals its multiplication in cultures of human tissue the path ology pathophysiology and treatment of the disease and immu nity and resistance to it were fully discussed The work of the participants gives hope that poliomyelitis may be brought under control within the foreseeable future and that we may become armed with effective immunizing procedures and improved means and methods for treatment

Discussions of the papers are included A section of the book entitled Reports of the Official Delegates summarizes the sta tus of poliomyelitis in 19 countries and about one-third of the book is devoted to the description and illustration of the scien tific exhibits The latter is an unusual feature and adds to the effectiveness of the presentation The binding and paper are ex cellent and the illustrations are well chosen An extensive bib liography is appended to most of the papers and to some of the discussions The volume is highly recommended

—Col T F Whayne MC USA

Pr pl f Ho p t l Adm tr t on by *J h R M G b y* M D Med c l Dir or Ch f D ion of M d l d Il p l R our Dur of Med l Ser U S P bl c H l h Serv c Amer l d f Fr t Med c d P blic H lth F llow Am c Med l A oc t Amer c l p t l A oct t F llow Amer P bl Il l h A oc t Ame A oc t on f Adva c m t f Sc 540 pag ll t t d G P P tn m So N w Y k N Y p bl h 1952

Dr McGibony a recognized authority on hospital management states that the purpose of his book is to bring together much of the knowledge pertaining to hospitals and to make it available in compact form to all those interested in promotion of better patient care The early chapters present the complex factors that are used in hospital planning The organization and operation of hospitals are then discussed and in the concluding chapter the reader is given valuable information on research in hospital services and resources Portions of the book of particular interest to military hospital administrators are those dealing with better patient care functional plans for hospital construction functional hospital organization and management and clinical services The entire book is a helpful instrument for the military man who aware of the increasing communication and exchange of personnel between federal and civilian hospitals desires to increase his understanding of modern civilian hospital practices There is an excellent index and abundant references are given at the end of many of the chapters *—Col C O Bruce MC USA*

THE USE AND MISUSE OF DERMATOLOGIC PREPARATIONS

WILLIAM R WALSH *Lieutenant Commander MC USN (1)*

DERMATOLOGIC therapy has been the butt of 2 general criticisms One group holds that dermatologists arbi trarily prescribe such a great variety of complex and mysterious compounds that it is a hopeless task for the non specialist even to approach the subject of dermatologic therapy, another group insists that dermatologists universally prescribe Lassar's paste for all skin diseases Contradictory as these criticisms are, they accurately reflect the feeling of the average nondermatologist toward local therapy of the skin, i e , that it is arbitrary, mysterious, and, on the whole, incomprehensible With this attitude, it is hardly remarkable that the average medical ıncer, when he must treat skin diseases, turns to the propri etary compounds or to the mixture that is most readily available on his pharmacy shelf Indeed this is the only thing for him to do unless he understands a few basic principles of the reaction of the skin to injury and of the physiologic actions of drugs on the

It is the purpose of this article to outline a rational approach to dermatologic therapy and to demonstrate that good dermatologic can be practiced with a surprisingly few, simple prepara In prescribing for skin diseases, the type of the skin erup the classes of dermatologic preparations, and the physi actions of drugs on the skin must be taken into account

THE TYPES OF SKIN ERUPTIONS

Like every other vital organ the skin reacts to injury in a of ways and in a succession of stages Skin eruptions may be exudative, vesicular, pustular crusted, scaling, or thick (lichenified), in the order of their increasing dryness or ty The same skin disease, in different stages, may pre itself as any of the types of eruptions mentioned For this son the general practitioner should think more of treating types eruptions and less of treating specific skin diseases

THE CLASSES OF DERMATOLOGIC PREPARATIONS

Before discussing the physiologic actions of drugs on the skin some of the simpler drugs which can be prescribed to ac

(1) U S N v l H p t l San D g Calif

complish these actions it is necessary to understand something about the various classes of dermatologic preparations in which these drugs may be dispensed These are soaks, lotion, pastes creams, ointment, and powders It is as important that a drug be dispensed in the correct class of preparation as it is that the correct drug be used

The *soak* or wet dressing, is the basic dermatologic preparation *Unfortunately the nonspecialist often uses other classes of* preparation such as ointments or creams, when soaks are clearly indicated Soaks are cleansing soothing mildly antiseptic and antipruritic They maintain drainage of infected areas and are excellent agents for relieving superficial inflammation The indications for soaks—or baths, if the eruption is generalized—are the acute inflammatory exudative or vesicular eruptions such as vesicular or pustular eruptions of the hands secondarily infected dermatophytosis of the feet, and rhus dermatitis Infected or pustular lesions should be treated with warm soaks and the contact type of dermatitis should be treated with cool soaks The best soak probably is Burow s solution which can be made in a 1 20 dilution by dissolving 1 domeboro tablet in 1 pint of water

Lotions are suspensions of powders in a water or water alcohol base They primarily are drying and therefore antieczematous They can carry a great variety of active medications In general *the indications for lotions are the acute exudative* dermatoses and they usually are prescribed in combination with soaks Examples of the indications for lotions are blistering sunburn, contact dermatitis or eczematised tinea cruris Because they are suspensions these preparations require frequent shaking to redisperse the solid agents which have settled in standing Therefore they are commonly called shake lotions A simple shake lotion is one consisting of 15 percent zinc oxide 15 per cent talc and 10 percent glycerin in water

A *paste* is a solid suspension of a powder in an ointment type of vehicle Pastes are much more adherent to the skin than lotions and therefore more protective The indications for pastes are the subacute or chronic dermatoses those of a more chronic inflammatory character and those in which free drainage does not have to be encouraged Pastes are used in subacute contact dermatitis or in any eczemas which are no longer weeping or vesicular As with lotions a great variety of active medications may be incorporated in pastes The simplest is Lassar s paste which consists of equal parts of zinc oxide and starch in petrolatum

Creams are water in oil or oil in water vehicles of a solid consistency They are much more penetrating than the vehicles previously mentioned and are used to provide intimate contact

between the active agent and the skin They are useful in subacute or chronic dermatoses, especially crusted eruptions such as the lesions of impetigo As a base for creams, ointment base, water soluble (item 1-316-420) is effective

Ointments are solid preparations with a fatty base Although there are definite indications for ointments, they are too often prescribed when some other class of preparation would be more useful They are lubricating, softening, very penetrating, and are effective in removing scales They are indicated in the chronic, dry, scaling, or thickened eruption They can be used, for example, in the dry, scaling type of dermatophytosis, or in psoriasis Whereas lanolin and petrolatum formerly were the bases for dermatologic ointments, these have been supplanted in the last few years by the higher fatty alcohols Too many patients were sensitive to wool fat and too many could not tolerate the friction and the soap required to cleanse the skin of petrolatum Hydrophilic ointment (item 1 229 675) is an effective and easily removed ointment base

Powders are primarily lubricating and are used to combat friction They generally are used in the intertriginous areas when there is no acute exudative process

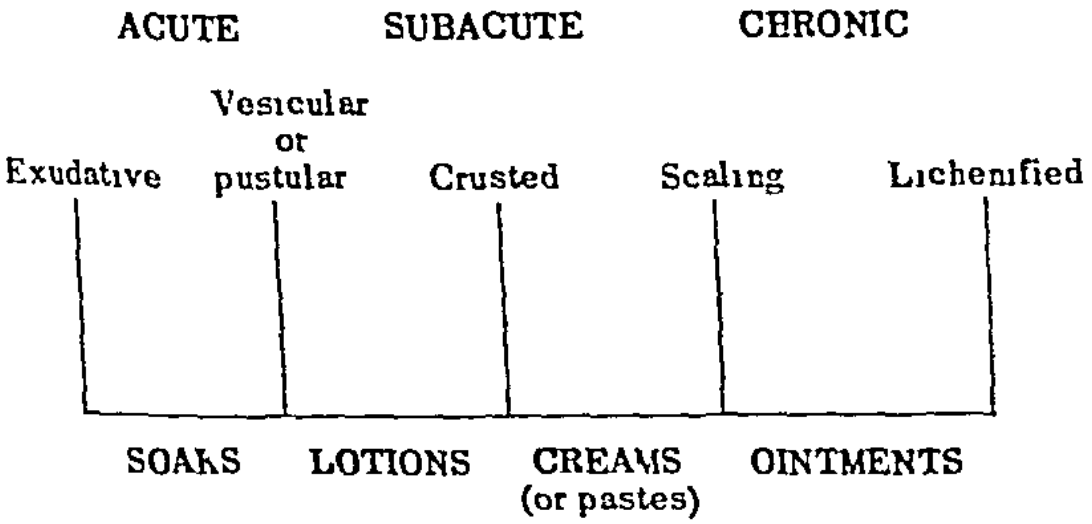


Figure 1 Classes of preparation indicated in different types of eruption

Figure 1 shows the class of preparation to be used in each type of eruption and may serve as a guide for the neophyte According to this scale there might be some question whether a cream or a paste is indicated in a given case but there would be no excuse for applying an ointment on an exudative eruption

THE PHYSIOLOGIC ACTIONS OF DRUGS ON THE SKIN

In every branch of medicine a drug is prescribed for its physiologic action on the body This principle seems to be lost sight

of only in dermatologic therapy Here we all too often find phy sicians prescribing local medication for the skin with no clear idea as to what specific action they want to accomplish or what the medication can accomplish Medications applied to the ki may be protective soothing, antipruritic antibacterial, anti fungal antiparasitic, keratolytic or corrosive A simple therapeutic arsenal, built on the basis of intended action in the kin, can be outlined as follows

Protection and soothing When we prescribe a medication for these effects we signify that we do not expect the medication to do anything to the skin beyond relieving the symptoms of irrita tion and protecting it against further injury In doing this we permit the skin s reparative processes to operate and often no further more active medication is required This is especially true in acute contact dermatitis in which the aim of therapy is to discover and remove the offending sub tance and to protect the skin from further damage until it can regenerate The class of preparation used to effect the protection and soothing will depend on the wetness or dryness of the eruption In a very acute oozing inflamed dermatosis, protection and soothing can best be achieved by interrupted wet dressings of Burow s solution in a 1 20 dilution A somewhat less exudative process can be treated with less frequent wet dressings alternating with a lotion For the subacute drier eruption a paste such as Lassar s paste is indicated We can continue across the scale to a chronic, dry scaling eruption for which an ointment would be indicated.

Antipruritic Pruritus is not nearly as common as is supposed but when present a thorough investigation to determine the cau e should be made Many antipruritic drugs achieve their effect at too high a price Some are extremely irritating others are highly sensitizing Among the latter are the cocaine derivatives About 10 percent of patients using these substances develop a sen i tization whether or not it is manifested by an immediate contact dermatitis Sensitization to a cocaine derivative is a real disability in this age because of possible cross sensitivity to related compounds of the para-aminobenzoic acid nucleus

The possibility that the patient may not be able to obtain the benefits of procaine anesthesia from the dentist may not be able to take sulfonamides or may become sensitive to paraphenylenediamine a basic dye substance must be con idered before a surface anesthetic is prescribed The safest and most satisfactory antipruritic is menthol It is prescribed in a 0 5 percent strength the class of preparation depending on the type of eruption being treated Thus for an acute itching rhus d rmatitis it could be prescribed in a lotion but for a chronic thickened pruritic patch of neurodermatitis a hydrophilic ointment base would be preferred

Antibacterial Pyogenic infections of the skin are common, either as primary pyodermas or more often, as secondary infection of other dermatoses There are innumerable antibacterial preparations for use on the skin, but many of them are extremely sensitizing or irritating An effective antibacterial agent for general use is 3 percent vioform in ointment base, water soluble Warm Burow's solution soaks or wet dressings should be used until the eruption has subsided to a degree that an antibacterial cream is indicated.

Antifungal The injudicious use of fungicides probably causes far more disability than do fungus infections An added irony is the fact that many dermatoses unskillfully treated with fungicides are not fungus infections at all. Actually fungi are responsible for a relatively small percent of all skin diseases and those which are truly fungus infections can be confirmed by simple laboratory tests Fungi in the skin can cause eruptions that run the gamut from acute exudative eruptions to dry scaling, hyperkeratotic plaques The therapy depends on the type of eruption. The exudative types, which are common, should be treated only with soaks preferably a 1 20 000 solution of potassium permanganate After the acute exudative process has subsided a more specific fungicide may be used. The most practical one is fungicidal ointment (item 1-20J-180)

Antiparasitic The most common skin parasites are the scabies mite and the pubic louse Fortunately the gamma isomer of hexachlorocyclohexane is effective against both Commercially it is known as gammexane or lindane. It is best employed as a 1 percent lotion *(2)* Unlike sulfur and benzyl benzoate this is not irritating to the skin and, in the treatment of these infestations only rarely is more than a single application required

Keratolytic agents are indicated in dry scaling lesions in which it is desired to reduce the thickness of the skin They, like the fungicides can cause great damage if not properly used. They should never be used on exudative vesicular or inflamed lesions The most common and the safest keratolytic is salicylic acid. It is usually dispensed in an ointment base because the eruption to be treated is the chronic dry, thickened type. It may be prescribed in a strength of from 3 to 10 percent, depending on the thickness and the location of the lesions to be treated.

Corrosive agents are used to destroy tissue or abnormal growths Although they must be used with caution they can be used with a fair degree of safety on venereal warts. The agent most commonly used for these lesions is 25 percent podophyllum

(2) Pillsbury, S. C. Emulsion of hexachlorocyclohexane for scabies. U. S. Armed Forces M. J. 2: 399-400, Mar. 1951.

resin in tincture of benzoin This has a selective action on the warts only and though irritating to the normal skin does not permanently damage it. Under this therapy, most venereal wart melt away after 2 or 3 applications

That completes the dermatologic pharmacopeia built on the basis of the desired effect on the skin. The only drugs or compounds mentioned were (1) Burow s solution, (2) zinc oxide lotion (3) Lassar s paste (4) ointment base water soluble (5) hydrophilic ointment (6) menthol, (7) vioform cream (8) potassium permanganate (9) fungicidal ointment (10) salicylic acid (11) gammexane and (12) 25 percent podophyllum resin in tincture of benzoin The average physician not trained in dermatology could probably practice much better dermatologic therapy with these few preparations than he could with twice or 10 times as many

DERMATITIS DUE TO OVERTREATMENT

Overtreatment dermatitis is a dermatitis venenata due to medication applied externally It may take the form of a reaction ranging anywhere from a mild vesicular eruption at the site of application to a generalized fatal exfoliative dermatitis The initial eczematous response will be at the site of application of offending substance but from there it may spread to any or eas of the skin if sensitization occurs This bizarre be x of the skin is difficult for the average physician to understand and for that reason he is loath to accept the explanation offered He is more inclined to think that the original dermatosis for which he applied the medicine has spread to another location and his remedy for that is more of the same ointment Each application of the offending medication results in a progressively more severe dermatitis

Contact dermatitis due to medication is a primary cause of disability in skin diseases Most consulting dermatologists say that the majority of the patients they see have been overtreated and that they must use bland nonspecific therapy for from 7 to 10 days either to allay a superimposed contact dermatitis or to discover what the basic condition really is

The prevention of contact dermatitis due to locally applied medication involves (1) the use of simple drugs of low sensitizing potentiality such as the 12 preparations listed above (2) the avoidance of most proprietary compounds which are usually a mixture of many and sometimes mysterious substances and (3) a constant alertness for the appearance of contact dermatitis due to treatment and a willingness to change the medication as soon as this appears

SUMMARY

The nonspecialist can practice safe and effective dermatologic therapy with a few simple preparations He must first, however, understand (1) the types of skin eruption, (2) the classes of dermatologic preparations, and (3) the physiologic action of drugs on the skin

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BOOK REVIEWS

B-Vitamins for Blood Formation by *Thomas H Jukes* Ph D Lederle Laboratories Division American Cyanamid Company Pearl River N Y American Lecture Series Publication Number 146 A Monograph in American Lectures in Pharmacology Edited by *Chauncey D Leake* Ph D Vice-President in Charge of Medical Affairs The University of Texas Medical Branch Galveston Tex 113 pages illustrated Charles C Thomas Publisher Springfield Ill 1952 Price $4

This small volume contains a wealth of information concerning tested biochemical and physiologic relationships bearing on the cause and the treatment of blood dyscrasias, with emphasis on the megaloblastic anemias Extensive coverage is accorded to the chemical and the clinical properties of pteroylglutamic acid and related compounds antagonists of pteroylglutamic acid, the vitamin B_{12} group, and the intrinsic factor The result achieved by the combined efforts of author and editor is a well coordinated review of available experimental findings The arrangement of most of the chapters is such as to permit ready access to material which is predominantly either biochemical or clinical. In view of the relative newness of the synthesis of pteroylglutamic acid (1945) and of the isolation of vitamin B_{12} (1948), it is appropriate that much or most of the literature cited in this monograph should be of recent origin

—Lt Col T J Domanski USAF (MSC)

Blood Clotting and Allied Problems Transactions of the Fifth Conference January 21 and 22 1952 New York N Y edited by *Joseph E Flynn* M D Associate Professor of Pathology College of Physicians and Surgeons Columbia University New York N Y Sponsored by the *Josiah Macy Jr Foundation* New York N Y 368 pages illustrated Printed by Corl es Macy & Co Inc New York Y Price $4 95

Although this volume deals with research problems, the chapters devoted to the clinical evaluation of the newer anticoagulants, and new clotting factors are of value to the clinician The ex

periences with the clinical use of tromexan and anticoagulant No 63 are related and they are compared with dicumarol Paritol C treburon, and phenylindandione are evaluated clinically Further studies regarding clotting are presented and controversial points are discussed The latest concept of clotting differs greatly from the original theory of Howell and the reader is introduced to such new substances as proconvertin convertin proaccelerin accelerin, and antithrombin As a result of the newer concepts several new hemorrhagic diseases have been described and a new classification has been proposed for the hypoprothrombinemias

The second half of the book deals with the blood clotting changes following irradiation and the factors involved in the hemorrhagic manifestations which result from exposure to the products of nuclear fission There is an excellent chapter on a proteolytic enzyme system in the blood in which a fibrinolysin and an antifibrinolysin are factors

The first chapters are the only ones which would be of interest to the internist The chapters on irradiation will be of value to radiation therapists and those involved in the problems of atomic bomb casualties The rest of the book will be of limited interest except to hematologists and laboratory workers in this field

—*Commander H A Lyons MC USN*

Diseases of the Esophagus by *Philip Thomas Kirklin* M D F A C S F I C S Assistant Clinical Professor of Surgery (Formerly Associate Gynecology and Topographic Anatomy) University of Illinois College of Medicine Diplomate of the American Board of Surgery Professor of Physiological Diseases and Clinical Surgery Cook County Graduate School of Medicine Member of the American Association of Anatomists Fellow American College of Chest Physicians Consulting Surgeon in Charge of the American Hospital Attending Surgeon Cook County Hospital Associate Attending Surgeon Mount Sinai Hospital Author of Textbook of Anatomy in Surgery Drawings by C I T Lindahl Associate Professor of Medical Illustration University of Illinois College of Medicine 140 pages Illustrated J B Lippincott Company Philadelphia Publishers 1952 Price $10

This is a comprehensive and much needed treatise on diseases of the esophagus from the surgeon's point of view The anatomy and physiology are clearly presented and the pathology and surgical treatment of the various pathologic conditions of the esophagus are discussed with excellent accompanying drawings of lesions Surgical procedures are well illustrated The author includes in his chapter on esophageal hiatus hernia a discussion of all hernias of the diaphragm and the various treatments recommended This book should be on the shelves of all medical libraries and should be read by all surgeons —*Commander L L Haynes MC USN*

SELF-CURING ACRYLIC RESIN CROWNS AND INLAYS

SEYMOUR M LONDON *Lieutenant DC USNR (1)*

THE demand for restoration of broken-down upper anterior teeth at this naval receiving station is great Ship movements resulting in limited availability of patients for whom treatment was recommended necessitated a rapid restorative method The purpose of the technic here described is to provide an immediate replacement for extensive loss of tooth structure It is used mainly for the upper 6 anterior teeth and can be accomplished in 1 sitting

As with all dental materials used in operative dentistry the methyl methacrylates have their advantages and disadvantages The search still continues for the ideal filling material There is probably more room here for improvement in anterior restorations than in any other procedure in dentistry The use of the acrylics as filling materials is not the ideal solution it is merely a step in the right direction, and only through the use of this material will we be able to evaluate its place in dentistry

I will not describe the strictly operative procedures, and the suggested technics are only some of those that are being developed The operator is familiar with the characteristics of the material he uses End results usually speak for themselves, and what might be preferred by one dentist need not necessarily be preferred by another Self-curing acrylic resin has, however a definite place in dentistry

SELF CURING ACRYLIC RESIN CROWNS

The two main types of self curing acrylic resin crowns are (1) conventional jacket crowns which are usually placed on vital teeth and (2) dowel or post crowns which are placed on nonvital, badly broken teeth The prerequisite for this second type of crown (usually preferred for all nonvital teeth) is a good root canal filling

Contraindications When it is possible to process a crown conventionally the self curing acrylic resin technic should be second choice When in the construction of the crown it is found

(1) Naval Receiving Station U S Naval Base Norfolk Va at time of writing

periences with the clinical use of tromexan and anticoagulant No 63 are related and they are compared with dicumarol Paritol C treburon, and phenylindandione are evaluated clinically Further studies regarding clotting are presented and controversial points are discussed The latest concept of clotting differs greatly from the original theory of Howell and the reader is introduced to such new substances as proconvertin convertin proaccelerin accelerin, and antithrombin As a result of the newer concepts several new hemorrhagic diseases have been described and a new classification has been proposed for the hypoprothrombinemias

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—*Commander H A Lyons MC, USN*

) s of th E ph g by *Ph l p Th k* M D F A C S F l C S A t Cl l Pr f s f Surge y (Form ly g d t Gr s d T p g aph A t my) Un ty f Ill no Coll g of Medicin D pl mate of the Am n Boa d of Surg y P fe sor of E ph g l Di s d Cli l Surge y C ok C unty G d ate School of M d in Membe f th Ame c A sociation of Anat m t F l low Am n C ll g f Ch t Phy ia Co Surg on Chief of th Ame H p l Att di g Surge f the C k C unty Hosp S or Att d g Surge n f th Ale B oth H pit l A thor of Te t A tomy in Surge y Dr wings by *Ca l T L nd* A s ta t P f ss of M d l Ill t n U ty f Ill s C ll g of Med i Chi g 140 pag ill trat d J B Li pincott C Ph l d lph P p bl h 1952 P $10

This is a comprehensive and much needed treatise on diseases of the esophagus from the surgeon s point of view The anatomy and physiology are clearly presented and the pathology and surgical treatment of the various pathologic conditions of the esophagus are discussed with excellent accompanying drawings of lesions Surgical procedures are well illustrated The author includes in his chapter on esophageal hiatus hernia a discussion of all hernias of the diaphragm and the various treatments recommended This book should be on the shelves of all medical libraries and should be read by all surgeons —*Commander L L Haynes MC USN*

The reasons for allowing a portion of the tooth stump to remain are that (1) it enables the crown to have a little more retention than it would have if the entire stump were removed, (2) the stump serves as a key or lock (meaning that the tendency for the crown to rotate is eliminated), and (3) a definite seat for the crown is provided during cementation As with conventional preparations, all margins should be carried well up under the free gingiva, preferably 1 mm , although under some circumstances a lesser amount is acceptable



Figure 2

Impression technic The only difference between the conventional copper band impression and the technic used here is the material used The copper band is festooned in the usual manner so as to fit snugly over the margin of the preparation If there is a choice to be made between a smaller and larger band, the larger should be used After the band is well fitted, it is placed on the tooth and then squeezed labiolingually to obtain the proper mesiodistal diameter of the crown (fig 2) Annealing is contraindicated

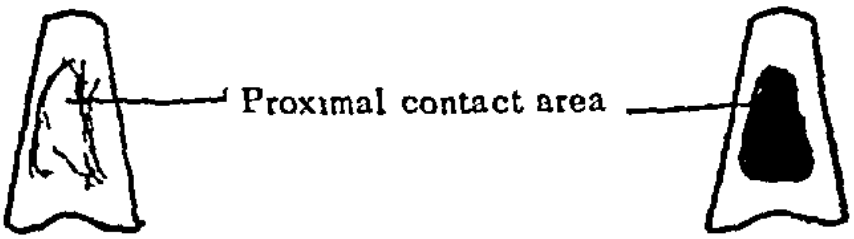


Figure 3

With the band in place at this point, a sharp explorer is used to scratch the proximal area of contact between the band and the adjoining teeth This is usually a triangular shaped marking on the proximal surface of the band (fig 3) This area is cut out with a suitable fissure bur The band is then removed from the mouth and a piece of thin matrix material is wrapped around it and secured with a tinner's joint (fig 4) The thinner the matrix material, the better, although it should not be thin enough to tear when placed under pressure The metal matrix material supplied with the acrylic resin kits is satisfactory This matrix material

eliminates the excessive thickness of the copper band and thereby makes for better contact between the crown and the proximating teeth Furthermore it provides a method of confining the acrylic in the band so that when pressure is applied, a dense material is obtained

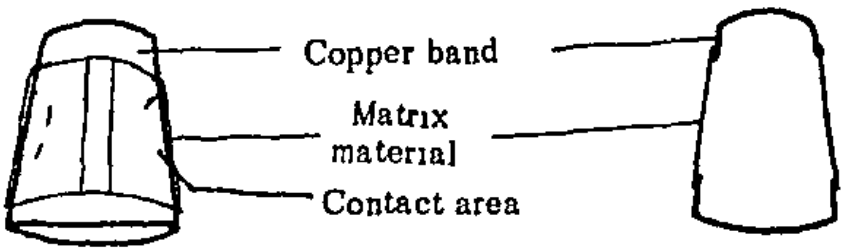


Figure 4

Processing The shade is selected in the usual manner although it is advisable to select the darker of the two shades closest to the one desired It is sometimes necessary to use more than one shade for the production of the desired final shade The shade or shades selected are placed on a cool slab If more than one shade is selected they are mixed dry Because this material is handled differently than others the manufacturer s directions should be followed A patting motion rather than spatulation should be used in mixing This brings the excess monomer to the surface and more powder can be easily incorporated into the mix The density of the crown is probably dependent more on the mix obtained on the slab than on any other part of this technic

After the mix reaches the proper consistency or the dead pack stage the bulk of material is placed in the copper band The tooth should be clean and dry The mix is then carried to the proper position and forced into place with finger pressure on the incisal opening of the band For jacket crowns the material is allowed to set until heat has begun to generate It is removed from the mouth and allowed to complete its polymerization either on the dental tray or preferably, on a hot sterilizer Only about 20 seconds are necessary to complete the cure on the sterilizer A longer time will cause the acrylic material to dry out and contract For dowel crowns the material is allowed to complete its cure in the mouth The main difference from the jacket crown is the fact that the material is provided the opportunity of getting a firm grip on the stock dowel without any chance of distortion

Carving and contouring The copper band is peeled away from the acrylic material The gingival margin then serves as a guide to the removal of any gingival flash with fine disks The acrylic material is returned to the tooth and carving with suitable stones disks and wheels completes the crown It should be polished

with fine pumice followed by whiting, zinc oxide, or tin oxide The contact points are tested with dental floss If found to be insufficient, additional material may be painted on The only objection to this is that the density of the material may vary because of the difference in technic in handling the acrylic It is better to obtain sufficient contacts with the original amount of material

Cementation The cementation of the dowel crowns has been accomplished by using the ordinary oxyphosphate cements If the labiogingival portion is thin, a shaded cement is indicated A clean, dry tooth and crown are the only precautions necessary

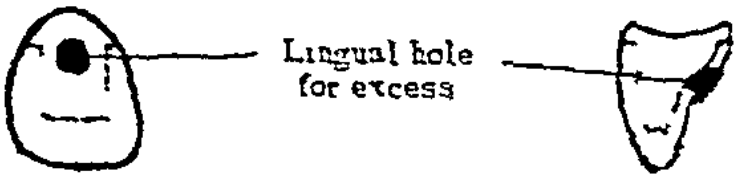


Figure 5

The cementation of the jacket crowns is another matter Numerous cementing substances have been tried, and most of them have been found to be only fairly satisfactory At present, a new method of cementation which makes use of the same material that was used to construct the crown is being tried It is a type of welding of the crown to the tooth because the cementing substance and the crown itself become one solid mass

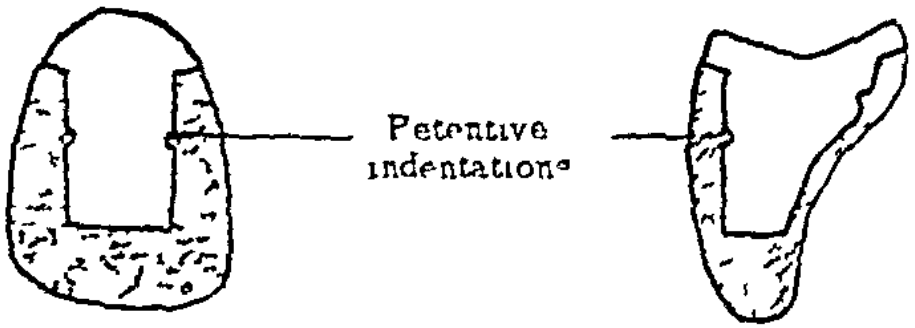


Figure 6

A hole is cut in the lingual aspect of the crown with a No 4 bur This hole is located in the area of the linguogingival fissure (fig 5) For retention of the crown on the tooth, a No 2 bur is used to make indentations in the axial surfaces of the tooth preparation to a depth of about half the diameter of the bur (fig 6) Both the tooth and the crown are washed with water and dried thoroughly The cementing procedure is then begun

On a clean, cool, glass slab, a small amount of the powder is placed at one edge Just before the mixing is begun, a drop of monomer is placed in the center Then a little of the acrylic is

made and placed in the crown approximately in the areas which would correspond to the areas of indentations made on the tooth preparation This mix will have a tendency to dry out rapidly and thus prevent the proper seating of the crown To overcome this another small drop of the monomer is placed in the crown and the crown is set in place It is firmly seated tapped lightly with a surgical mallet several times and allowed to set until the excess which escapes through the lingual hole has hardened

When the cementation is completed and the material is sufficiently hardened the lingual knob of material may be easily reduced and final finishing accomplished with a stone rubber Burlew disk and pumice

Final examination After the crown has been completed there are several observations that should be made to insure complete success Gingival marginal adaptation should be checked gently with an explorer to insure the proper seating of the crown At times there may be an escape of some gingival flash during the cementation This should be checked and removed The final point to be observed is that proper occlusion has been established for the crown particularly in the protruded relationship of the mandible Because of the tendency of this material to flow under stress it is often advisable to relieve the occlusion slightly to prevent this from occurring

SELF-CURING DIRECT ACRYLIC RESIN INLAYS

This type of restoration is used primarily to restore the incisal angles of the anterior teeth when the only other operative procedures that would be indicated are jacket crowns or gold castings of some sort The constructed inlay is usually placed in such a manner as to receive a minimum of stress and strain The tendency of this material to flow when placed under stress must always be considered an important factor in its use

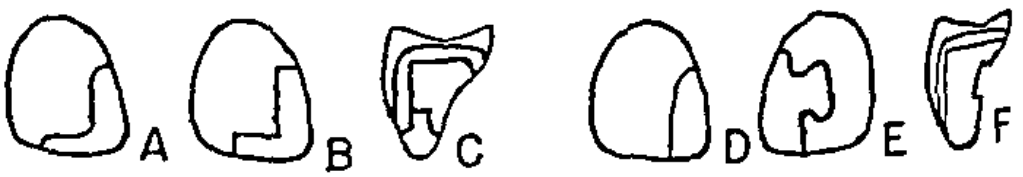


Figure 7 (A) (B) *and* (C) *Incisal step type* (D) (E) *and* (F) *Lingual lock type*

Cavity preparation Two basic types of cavity preparation are used for these inlays Both are the class IV preparations one being of the incisal step variety (preferred) and the other being of the lingual lock variety A conventional cavity preparation is used with parallel or slightly divergent walls cut to permit the drawing of the inlay No bevels are placed and it is desirable to have sharp well-defined cavosurface angles (fig 7)

Casting the inlay This procedure is so called because the inlay is cast directly to the tooth A piece of steel matrix material is inserted interproximally so as to extend incisally beyond the length of the crown (fig 8) It is securely wedged in place gingivally and then adapted around the tooth and held in place with the fingers or a suitable clamp The wedging of the band provides enough separation to insure contact and it closely adapts the matrix to the gingival margin of the preparation

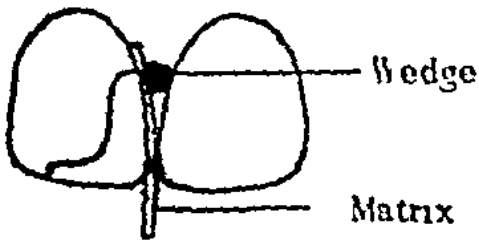


Figure 8.

After the band is adapted to the tooth, the acrylic is mixed to the proper consistency on a clean glass slab One mass of the material is then carried to the tooth and forced into the cavity An excess of the material should be allowed to extrude incisally so that pressure may be applied with the finger or a suitable plastic instrument If a plastic instrument is used, the heel of its blade should rest on the sound portion of the incisal edge of the tooth, with an inclination of the blade incisally so as not to shorten the length of the restoration prematurely Pressure is maintained constantly during the initial set of the material and the band is removed only after all the heat has been disseminated (usually after from 4 to 6 minutes)

The inlay is then carved to proper contour with only a slight excess remaining around all the margins except those which are inaccessible in the mouth The gingival margin should be trimmed to proper form

Cutting retention points In the discussion of the cavity preparation, no mention was made of the retention of these inlays In this technic no retention was incorporated into the cavity preparation so that the inlay could be removed from the tooth While the inlay is out of the mouth, it is advisable to leave it in a cup of water to prevent its drying out Retention areas should be cut in the tooth in such a way that the angles are rounded leaving no sharp retentive points If possible, these areas should be continuous This has been found to be best accomplished by using a No 2 bur, which is carried around all the line angles that are in the preparation so as to incorporate a continuous retentive groove

In the case of the incisal step type of preparation, this same No 2 bur is used to sink a pinhole in the gingival floor and a pinhole in the distal extremity of the incisal step (fig 9) The depth of this pinhole is usually the diameter of the bur The walls of the pinholes are formed with a No 557 fissure bur What can be considered as the floors of these pinholes are further made retentive by using a No ½ bur around the base line angles (fig 10)

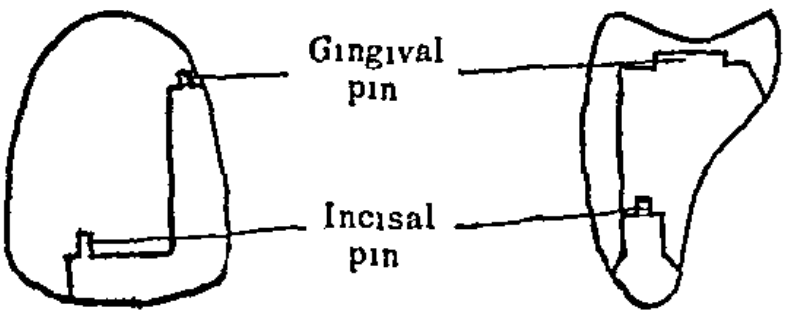


Figure 9

It was previously mentioned that the incisal step type of restoration was preferred The reasons for this are primarily based on the mechanical type of retention that is necessary to hold the inlay in the tooth There is no adhesiveness of this material to the walls of the cavity and as a result retention must be considered as mechanical The incisal step inlay provides more of an opportunity to lock itself into position The critical points are located in the areas of the incisal pin the axiopulpal line angle and the gingival pin (fig 11)

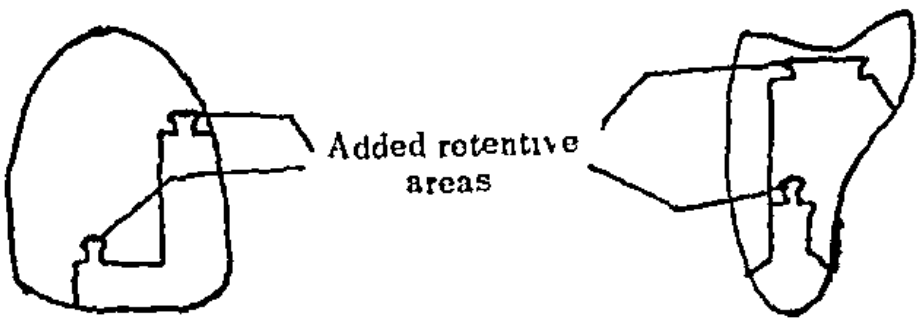


Figure 10

These o areas permit the filling to be firmly locked in position In the lingual lock type of inlay the greater amount of retention depends on that area of the lingual lock The biggest drawback to the use of this type of inlay is the bulk of material that is butted up against tooth structure along the line of the axial margin of the restoration (fig 12) As was previously mentioned because of the lack of adhesiveness of the material and its tendency to flow under stress this inlay should be used

only as a second choice, the incisal step type being preferred The choice as to which type of inlay to use may come up and it has been found that the only factor involved is the labiolingual width of the tooth in question For a thin labiolingual tooth, use the lingual lock For a thick labiolingual tooth, use the incisal step

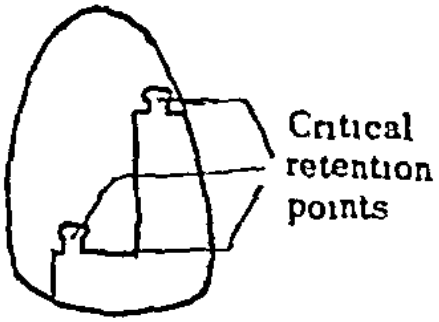


Figure 11

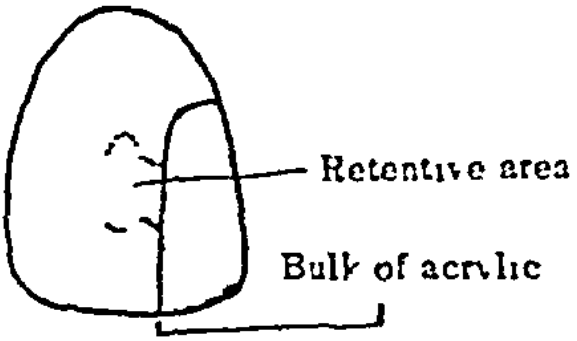


Figure 12

Cementation The cementation of these inlays is similar to that used for jacket crowns There is a dual purpose here in using the acrylic material as the cementing substance The first consideration is the fact that the material used in cementing and the material of the inlay become one solid mass This might be thought of as approaching the ideal situation because it eliminates the use of an intermediary cementing substance Furthermore by using this method of cementation, most of the contraction during the initial set of the inlay is compensated for, although not necessarily completely eliminated Recent studies have shown that on setting, about 7 percent contraction occurs

The cavity is washed with warm water and dried thoroughly after the retentive areas have been cut The inlay, which during the period it is out of the mouth has been kept immersed in water, is also dried thoroughly A thin mix of the acrylic material is placed in the cavity, a drop of the monomer is placed on the inlay, and the inlay is carried to position and properly seated by exerting great force The pressure used in seating the inlay is maintained for at least 6 minutes The pressure need not be excessive, but it should be sufficient and constant Intermittent pressure causes rocking with resultant distortion

Finishing of the inlay may be instituted after a period of from 15 to 20 minutes A good determining factor as to when the finishing might be started is the hardness of the excess which extrudes beyond the margins of the inlay When this material is brittle, finishing may be started Careful polishing should be done with fine disks and the material trimmed down to the margins of the cavity preparation Permitting a slight flash to remain makes for easier staining of the margins as well as the possibility of

inducing seepage to take place The last step is the use of fine pumice This too should be done carefully so as not to remove more of the inlay than is desired

Incompatibilities and lack of setting Mention has often been made of the use of a clean and cool glass slab The reason such stress has been placed on this point is simply to eliminate work The incomplete setting of this material is probably caused more by contaminated mixing instruments than anything else Eugenol and some other essential oils are not compatible with the methyl methacrylates Because eugenol is used often in the dental office, care should be taken to keep it away from the monomer and polymer of the acrylic kit A separate glass slab and spatula should be kept for the specific use of mixing the acrylics

SUMMARY

Self curing acrylic resin crowns and inlays have been found to be satisfactory restorations in over 100 patients who were available for only a short time When time permits self-curing acrylic crowns and inlays should not be substituted for laboratory processed restorations

BOOKS RECEIVED

Clinical Application of Suggestion and Hypnosis by *William T Heron* M A Ph D Professor of Psychology University of Maine Medical Manual 2d ed 137 pages Charles C Thomas Publisher Springfield Illinois 1953

Gifford Textbook of Ophthalmology by *Fred Adler* M D Professor of Ophthalmology University of Pennsylvania Medical School Consulting Surgeon Wills Eye Hospital Philadelphia Pa 5th ed two 488 pages illustrated W B Saunders Company Philadelphia Pa publisher 1953

Treatment of Mental Disorders by *Leo Alexander* M D Director Neurological Research Boston State Hospital and Instructor in Psychiatry Tufts Medical School 507 pages illustrated W B Saunders Company Philadelphia Pa publishers 1953

TREATMENT OF RHUS DERMATITIS

Ineffectiveness of Cortisone

ROBERT J HOAGLAND *Colonel MC USA*

THE treatment of rhus dermatitis is a fertile field for medical and nonmedical writers. Innumerable remedies have been proposed by both groups, and annually new remedies are proposed, hailed by uncritical users, and ultimately discarded or sporadically used in the vain hope that the course of the disease will be altered The large number of curative remedies proposed without convincing evidence of merit reflects the prevalence of uncontrolled investigations

Investigation and evaluation of a proposed treatment for poison ivy dermatitis is difficult because there are individual variations in the type of lesion resulting from exposure In some patients the lesions are chiefly papular; others have blebs, vesicles, and oozing lesions, and others have a cellulitis. Most patients complain of pruritus, but some have little or no itching The final extent of involvement and the severity of the disease cannot be predicted accurately when the patient is first seen because new lesions often continue to appear for several days after exposure Trauma produced by scratching during sleep may delay recovery For these reasons, comparisons of different modes of treatment in different patients are misleading Comparisons of new treatments with treatments used on previous occasions by the same patient are also unreliable because the degree of dermatitis in previous attacks is not known to the investigator, the susceptibility of patients is variable and patients' memories are faulty Successive use of different medications on the same lesion cannot lead to convincing conclusions because the first medicament is usually applied while the disease is in its ascendancy, whereas later treatments may merely coincide with spontaneous recovery Furthermore unless patients are carefully observed, it cannot be ascertained whether the remedies prescribed are being properly used and whether subjective improvement is reflected in rapid healing Finally the most experienced observer cannot predict, with accuracy, how large the individual lesions and how extensive the area of dermatitis will become or how long the dermatitis will last. This inability to forecast the progress of the disease makes the careful control of investigations of curative agents doubly necessary

In a previous paper on this subject *(1)* the literature was reviewed and it was further observed that locally applied tripelennamine cream, zinc sulfate solution tannic acid solution with chlorothen, propylparahydroxybenzoate and ethyl chloride spray were ineffectual

In view of the favorable influence of cortisone on the course of allergic conditions and its dampening effect on some inflammatory responses to stress it seemed worth while to use this hormone orally and locally, in treating rhus dermatitis A 3 percent aureomycin ointment was used also locally on several patients receiving cortisone to investigate the possibility of curtailing the course of ivy poisoning by affecting superficial bacteria

METHOD

Patients were divided into 3 groups In the *first* group alternate patients were given cortisone tablets *(2)* and similar appearing placebo tablets orally Both sets of patients received only petrolatum locally The ward nurse dispensed the 2 kinds of tablets alternately in accordance with a program laid down prior to the start of this investigation I was unaware of which medicine patients were receiving until after evaluation of the results. Cortisone was dispensed thus 300 mg was divided in 4 equal doses on the first day 200 mg on the second and 100 mg on the third and fourth days of treatment.

The *second* group received cortisone orally and aureomycin ointment *(3)* locally In this group also I was unaware of the treatment employed until after evaluation of the results. These patients were interspersed among the first group so that the placebo-treated patients could be used as controls for both cortisone-treated groups

In the *third* group uniform appearing areas of rhus dermatitis were divided into equal halves by an indelible line. The area on one side of the line was treated with dibucaine ointment *(4)* and the other was treated with 2 5 percent cortisone acetate ointment *(2)* All patients were otherwise healthy young men Additionally 4 patients (2 women and 2 boys) received cortisone and petrolatum but I was aware of the form of their treatment Dosages were the same except for one of the boys (age 6).

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(1) Hoagland R J Uyeno P T and Cosand H C Treatment of Rhus dermatitis J A M A 145 61 64 Jan 6 51

(2) Supplied by Merck and Co Inc

(3) Supplied by Lederle Laboratories

(4) Supplied by Ciba Pharmaceutical Products Inc.

Several patients with moderate or severe pruritus received tolserol (5) orally or eurax lotion (6) without triethanolamine locally to investigate the possible antipruritic effects of these drugs

RESULTS

The results are shown in table 1 Of 12 cortisone treated patients, recovery seemed to be hastened in 3, whereas 3 of 7 placebo-treated patients also appeared to have had an accelerated course Of 4 cortisone-aureomycin ointment-treated patients 2 seemed to recover faster than was expected The unreliability of judging the effect of a treatment for rhus dermatitis on clinical experience is shown by the fact that almost half of the petrolatum treated patients seemed to be recovering somewhat faster than usual Sentences from progress notes made while I was observing the course of illness, and unaware of the treatment being given, are of interest.

TABLE 1 *Results of treatment of rhus dermatitis with cortisone*

Medication	Number of patients	Degree of severity of dermatitis			Number of patients recovering faster than initially anticipated
		Mild	Moderate	Severe	
Placebo orally	7	1	2	4	3
Cortisone orally	12	3	3	6	3
Cortisone orally and aureomycin locally	4	0	2	2	2

F ur pat ent wer treated with cort parat ly f om th bl ndly treated
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Case 1 First lesions were noted on 19 August 1951 Treatment and hospitalization were started on 20 August. The dermatitis was moderately severe On 22 August I wrote Definite accelera tion of recovery " On 23 August "We can call this healed now— very fast for this degree of involvement " This patient had received a placebo He had the most dramatic "cure" of any patient

(5) Suppl ed by E R Sq bb nd S
(6) S ppl ed by Ge gy C Inc

Case 2 Treatment began on day dermatitis began (31 May) about 18 hours after exposure Twenty four hours after starting treatment I wrote "Slight increase in size of vesicles" On 2 June "No change On 4 June "Lesions have reached a plateau level but new vesicles have appeared On 7 June Recovered This patient has had far worse experiences in previous years but this episode of dermatitis did not disappear unusually fast. This patient was treated with cortisone

Case 3 One woman with severe dermatitis first noticed lesions on 4 September 1951 and I knowingly prescribed cortisone on 6 September The dermatitis steadily worsened for 4 days and she was not cured until 21 September My notes stated. Treatment unquestionably valueless"

Reliable appraisal of the value of local treatment can readily be made if investigators will divide a uniform area of dermatitis with an indelible line and treat one half with a medicament and the other with a substance known not to affect recovery In at least one report advocating the use of zirconium (7) no control areas were used

The 2 5 percent cortisone acetate ointment applied to rhus dermatitis did not speed recovery Areas treated with this agent evolved no differently than the dibucaine-treated areas Six patients with moderate or severe itching had eurax lotion applied to elected areas They were not in the blindly treated group Eurax was used because it had been reported as having antipruritic effects A lotion without triethanolamine was used It did not lessen pruritus in any patient.

Five patients not in the blindly" treated group with moderate or severe itching received tolserol to test the antipruritic effect of this drug It did not allay itching but one patient stated that she felt unusually relaxed and could sleep without being awaked by pruritus This drug was given in 4 daily doses of 1 gram each

CONCLUSIONS

Patients with rhus dermatitis who were given cortisone orally did *not* recover more promptly than those receiving placebos

Areas of rhus dermatitis treated with cortisone acetate ointment did *not* heal faster than those treated with dibucaine ointment. Tolserol given orally and eurax lotion without triethanolamine applied locally were ineffectual in allaying the pruritus of rhus dermatitis Aureomycin ointment applied locally may accelerate recovery and deserves further investigation

(7) Cronk G A [illegible] D E Z [illegible] Arch Dermatol & Syphilol Chicago 37 909-913 June 1951

EPIDEMIOLOGY OF LEPROSY IN AMERICAN SAMOA

JOHN A C GRAY *Captain MC USN*

Communication with the outside consists of weekly or biweekly sailings by interisland vessels to Apia Western Samoa and occasional visits by steamships from Honolulu the United States and the Antipodes Formerly there were frequent flights by U S Navy planes from Honolulu

The island of Tutuila, in which all of the recorded cases of leprosy have occurred is about twice the size of \anhattan island It is long and narrow and is cut almost in two by the great Pago Pago Bay Owing to its central mountain ridge all villages with one exception are located on the flat coastal lands Since the use of Pago Pago Bay during the last century as a coaling station and later as a Naval Station, the population has tended to gravitate to that area.

METHOD OF STUDY

The data to be presented were collected from (1) family and contact histories of all available patients (2) records of the Public Health Department, (3) visits to the residences of known patients (4) interviews with older residents who were personally acquainted with former patients including deceased patients and (5) consultation with the sanitary inspector Afioga (High Chief) Sotoa, who placed his large geneologic knowledge at the disposal of the Public Health Department and rechecked his recollection of the earlier patients all of whom he knew by visits to their homes and families Because of this multi lateral approach to the problem and because of the small size of the area and of the population involved the data are believed to oe highly accurate

INTRODUCTION OF LEPROSY INTO AMERICAN SAMOA

There is a legend that leprosy was introduced into Samoa prior to the year 1900 by an escaped Hawaiian patient, who is said to have landed at Pago Pago and then to have fled to Upolu Western Samoa where he died It was impossible to verify this tale although it is entirely possible that there was such a person Assuming its truth there is no evidence that he infected per ons in American Samoa, and there is evidence to the contrary

It is generally accepted that the disease was introduced into South Sea islands by Oriental immigrants who followed the Caucasians into the area in the nineteenth century *(4)* Krämer noted the presence of leprosy in Western Samoa in the 1890 s *(5)* According to official reports published in 1913 *(6)* and in

(4) R ge L ad M ur E L prosy 3d d ti n W lliams & Wilki Co B lmor Md 1946 pp 8-9

(5) Kr me A D Samoa Ins l E N g l St gart 1903 p 14

(6) Ame ca Samoa A Ge l R por by h Gov nor U S Go rnme Pr ss Off W hing D C. 1913

TABLE 1 *The recorded cases of leprosy in American Samoa*

Patient	Age (years)	Sex	Year diagnosed	Type of disease	Means of infection	Current status
1	24	M	1917	Unknown	Unknown	Unknown
2	21	F	1919	Lepromatous	Unknown	Dece sed
3	27	M	1921	Unknown	Unknown	Deceased
4	20	F	1933	Unknown	Household	Deceased
5	16	F	1934	Unknown	Household	Deceased
6	16	F	1934	Tuberculoid	Hous hold	Makogai
7	18	F	1934	Unknown	Household	Deceased
8	24	M	1936	Unknown	Household	Deceased
9	48	F	1939	Tuberculoid	Hous hold	Arrested
10	20	M	1942	Tuberculoid	Household	Makogai
11	19	M	1942	Lepromatous	Household	Makogai
12	26	M	1942	Lepromatous	Extrafamilial	Makogai
13	16	F	1942	Lepromatous	H usehold	Makogai
14	14	F	1943	Lepromat us	E trafam lial	Makoga
15	36	F	1944	Lepromatous	Extr f milial	Makoga
16	9	F	1944	Unknown	H usehold	De eased
17	60	F	1944	Tubercul id	Hous h ld	Arre ted
18	54	M	1945	Unchar cte stic	Hous hold	Mak gai
19	16	M	1945	Lep omatous	H useh ld	Makogai
20	35	M	1945	Lepromatous	Househ ld	Mak ga
21	49	F	1945	U know	Unknown	Dec as d
22	45	F	1945	Unkn wn	Hous h ld	Arr st d
23	64	M	1945	Tuberculo d	Extr f milial	Mak gai
24	22	M	1946	Tub r ul id	H us hold	Makog
25	26	M	1946	L promat u	E tr fam lial	Mak gai
26	18	M	1946	Tub rcul d	H u.ehold	Makogai
27	24	M	1947	Unknown	Extr f m lial	Carvill La
28	22	F	1947	Tub rculo d	Extr f milial	Outpat e t
29	26	F	1949	L p mat us	H usehold	Mak gai
30	17	F	1949	L pr matous	H us h ld	M k gai
31	13	F	1949	L p matous	H us hold	Makogai
32	15	F	1949	L pr mat us	H usehold	Makogai
33	21	M	1949	Tub rcul d	Ext f mil l	Outpat nt
34	15	M	1949	Tubercul id	Hous h ld	Makoga
35	17	M	1949	Lepr mat us	H us h ld	M kogai
36	13	M	1949	L pr maton	H usehold	Makogai

TABLE 1 *Th co ded cas / leprosy Amer an Samoa—C ued*

P	Ag (y r)	Se	Y diag d	Type f d	M ns f nf	Current tus
37	13	M	1949	T ber ul d	Hous h ld	Mak gai
38	26	M	1949	T ber l d	U know	Outpati nt
39	40	F	1950	U harac	H us h ld	Mak ga
40	26	M	1950	L pr mat	H us h ld	Makogai
41	36	F	1950	L promat	H us h ld	Mak gai
	44	M	1950	T be ulo d	Extr f milial	Mak gai
4	16	F	1951	L pr mat us	E tr f milial	Makogai
	13	F	1951	T ber l d	Extrafamilial	Mak gai
	10	M	1951	Uncharac t t	Extrafamilial	Makog

i diag ha b v t d t P Am nca t m l gy perh p b ca by l pr s m

1916 ( ) it was unknown in American Samoa at the time The weight of the evidence uncovered in this study suggests that it was probably not overlooked

There is consequently little doubt that leprosy came into American Samoa from Western Samoa, being introduced either by Chinese immigrants or by the legendary Hawaiian A review of the available information leads to the conclusion that case 1 (table 1) was without epidemiologic sequelas but that cases 2 and 3 share the responsibility of having brought in and disseminated the disease

CASE REPORTS

Case 1 A man of mixed Samoan European ancestry was born in Apia Western Samoa in 1895 He lived in Tonga from 1910 to 1915 then returned to Apia. He came to American Samoa in 1916 He was recognized to have leprosy in 1917 and was returned to Western Samoa whence he was sent to the Central Leper Hospital Makogai Fiji During his brief stay in American Samoa he did not marry and the family with which he resided has long since moved away There is nothing to connect him with later cases He was discharged from Makogai as arrested in 1938 His present status is unknown

Case 2 A woman was born in Western Samoa in 1897 She came to Pago Pago American Samoa in 1918 as a bride She divorced her husband and moved to the village of Utulei (it is

(7) Amer S moa A Ge eral R port by h Gov rnor U S Gov men Pr ng Off e W h ngton D C 1916

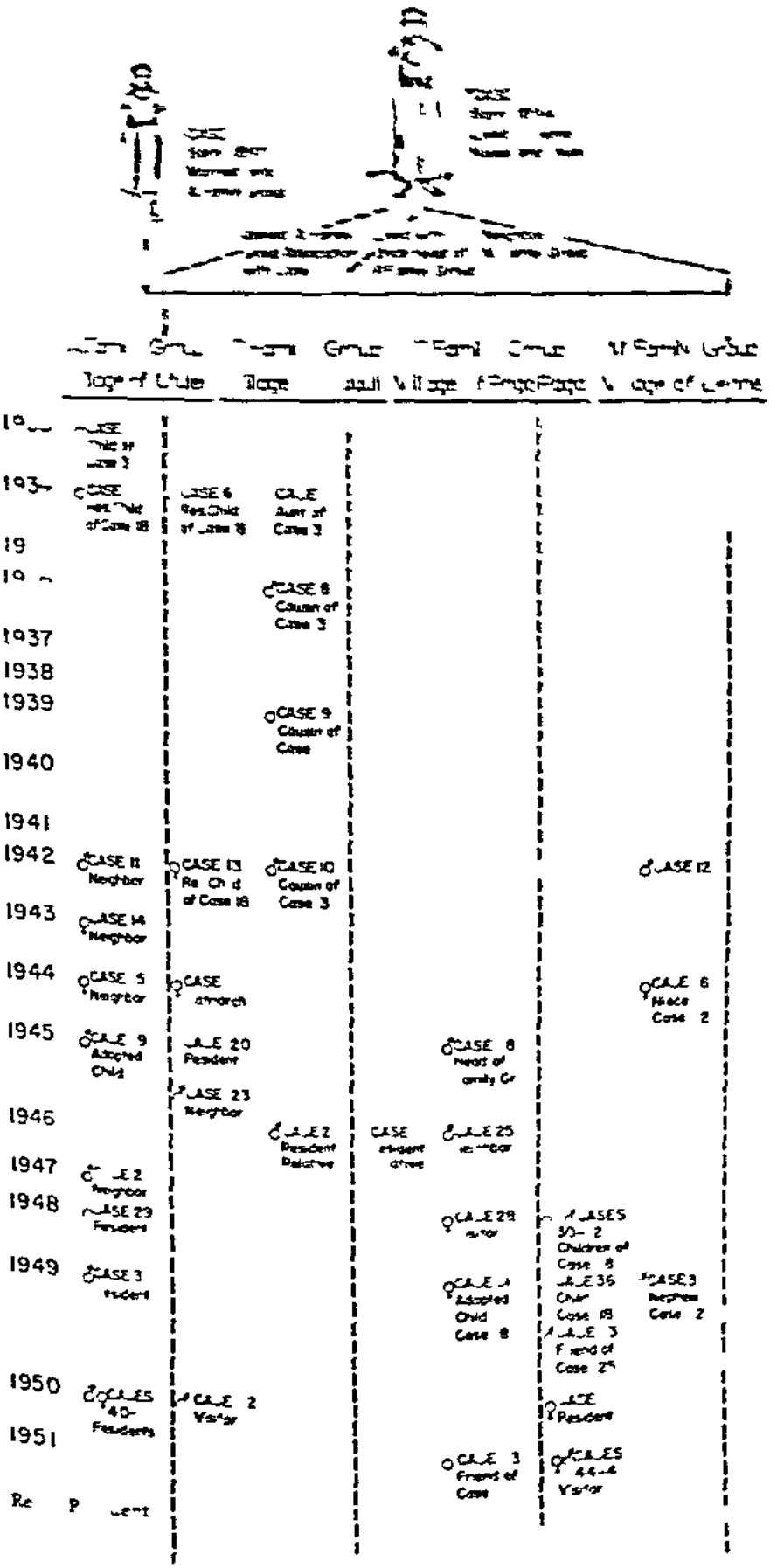


Figure 1 Diagram showing known spread of leprosy in American Samoa

said that her neighbors recognized her leprosy and forced her to move), where she married into the A family group In this group she was presently joined by case 3 (fig 1) The diagnosis of leprosy was made in 1919 but she was not isolated until 1926 (8) She remained at the Hospital of American Samoa until her death in 1944

Case 3 A man was born in the American Samoan village of Leone in 1894, but passed his childhood in Western Samoa. The exact date of his return is unknown but he was living in American Samoa in 1921 when he was found to have leprosy He was isolated at the Hospital in 1927 (8) In the meantime he had lived in Leone Nuuuli and Utulei In Leone he was a next door neighbor to the "M" family group (cases 15 16 and 37) in Nuuuli he resided with his uncle who was head of the P family group (cases 7, 8 9 10 24, and 26) In Utulei he joined the A" family group the largest single source of subsequent cases

These 3 family groups accounted for 41 of the 45 recorded cases in American Samoa From the facts as stated the conclusion that cases 2 and 3 were the joint initial vectors seems warranted

SPREAD OF LEPROSY

In order to make the spread of leprosy in Samoa intelligible, it is necessary to describe the organization of Samoan society The social unit is not the biologic family (father, mother children, et cetera) but the family group which is presided over by a chief who is not only regarded as the head of the family group but is referred to as the "father His wife may be introduced as the mother of our family The family group lives in one or more dwellings and consists of the chief and his wife, their children, and their children s wives (sometimes husbands) grandchildren junior siblings of the chief with or without families adopted children, other resident relatives and non relatives who for one reason or another, join the group The situation may be very roughly compared to the ante-bellum plantation in Southern United States where the owner often provided a home for relatives tutors technicians and visitors as well as for his immediate family

It had already been shown how case 2 moved into the A family group in the village of Utulei, which stands at the western side of the entrance to Pago Pago Bay and how case 3 lived at first in Leone a lovely village near the western end of Tutuila, and later at Nuuuli and finally joined the A family

(8) A nual R port Public H lth Depa tme t Am ic Samoa 1928.

group in Utulei It remains to explain the extension of the disease to the village of Pago Pago, about 2 miles distant from Utulei, at the head of the bay

The focus in Pago Pago began as a branch of the "A" family group—case 18, who was born about 1890, in Pago Pago, but resided with the "A" family group in Utulei from about 1920 until 1940 In 1940 he was elected chief of the "F" family group of Pago Pago, and moved back to that village, taking his family with him Three of his children (cases 5, 6, and 13) had already been found to have leprosy, case 5 having died In 1945 a diagnosis of leprosy was established in case 18 Later 4 more of his children and an adopted child, as well as several neighbors and residents, contracted the disease

Figure 1 attempts to present the known spread of leprosy in American Samoa graphically in terms of time and of the family groups involved There were only 4 patients (cases 1, 21, 22, and 38) who could not be fitted into this scheme The other 41 all fall readily into place because of known consanguinity, residence, frequent visitation, or frequent and intimate contact, alone or in some combination The vertical lines in the chart are to be regarded as lines of infection and not as family trees Case numbers and the sex of the patients are indicated to the right and left of the verticals, and a word or two indicating the nature of the patient's connection with the family group concerned is added

The data depicted in figure 1 show (1) the time lag between the recognition of cases 2 and 3 and of the secondary cases of the early 1930's, and the further time lag between these cases and the group of cases in the 1940's which probably correspond to the long incubation period of leprosy (9) (2) the danger in involved in household contacts with patients and the tendency of the disease to spread in families (3) the principal means of control, namely observation of household contacts and (4) the relative safety of persons not closely connected with vector families in view of the fact that 41 of the 45 patients registered at time of the conclusion of this study, are included in 3 family groups, and 1 branch

FACTORS AFFECTING THE SPREAD OF LEPROSY

Certain factors are known to favor the spread of leprosy in a community; others *may* favor spread and still others retard dissemination (10)

(9) D ell J A Studies on epidemiology of leprosy Proc Internat Cong Trop Med & Malaria 1 148 165 1948
(10) S footnote reference (4)

Factors favoring spread

1 *Climate* Leprosy thrives in a warm moist climate such as that found in Samoa.

2 *Population density* The average population density calculated from the 1950 census figures and area is 944 7 per square mile. Because most of the total area is un inhabitable it is much greater than this in the inhabited areas

3 *Changing social organization* Leprosy flourishes in a community wherein an old tribal organization is breaking down and in which a so-called modern social organization is as yet incomplete *(11)* Exactly this situation prevails in American Samoa The indigenous unit of society the family group is strongly ingrained in Samoan law and custom but contact with western monetary economy is diluting this system In the field of public health, the result is that the chief tends to surrender some of his authority to the health department, although the department is not as yet backed by a community fully aware of the value of preventive medicine. Happily with improving education this gap is rapidly narrowing

Factors probably favoring the spread

1 *The barefoot habit* Most Samoans do not wear shoes and their feet and lower legs (especially those of the children) are constantly subject to traumatic breaks in the skin, which may act as portals of entry for *Mycobacterium leprae*

2. *Insects* A number of insects have been regarded as possible vectors of leprosy Flies, head lice cockroaches and the mite of scabies are common in Samoa.

3 *Dermatoses* Minor dermatoses may create breaches in the skin through which more serious infectious agents may enter In American Samoa pyodermas and fungus infections are common especially in children

Factors which retard the spread of leprosy

1 *Good economic conditions* Although the annual per capita income is low by continental standards (it was estimated to be $96 in 1949) *(12)* the pastoral society abundance of food warm climate and simple clothing and housing requirements together with the indigenous social security system by which family groups care for their own

(11) M r E Ma ual of L prosy W lliams & W lki Co Bal more Md. 1948 p 146.

(12) Annual Report Publ Heal h Departme t Am ca Samoa 1950

render destitution unknown and money relatively unimportant. Necessities are available and poverty is not a factor in the spread of disease

2 *Education* With 27 percent of the population enrolled in a school system which includes primary and secondary levels, and with literacy in the Samoan language 100 percent, the education level is rapidly rising The result can only be to create an atmosphere unfavorable for a disease which thrives on ignorance.

3 *Available medical service* Beginning in 1900, the U S. Navy supplied the Samoans with medical services at far below cost. The annual per capita expenditure for health in 1949 was $15 99, of which the Navy contributed about two-thirds An index of Samoan satisfaction with medical treatment is the large annual admission rate to the Hospital of American Samoa In 1950, 2,771 persons (14 9 percent of the entire population) were hospitalized It is the announced intention of the Department of the Interior which has succeeded the Navy in administrative responsibility, to maintain a high standard of medical service

Thus although climate population density, and changing social organization favor the spread of leprosy, and although a number of factors possibly favoring spread exist, economic conditions the state of popular education, and acceptance of available medical service militate against it

CHARACTER OF THE DISEASE

The character of leprosy in a community is measured in terms of observations which indicate both status and trends There are the type rate, age rate, sex rate, race incidence, class incidence, and contact rate *(13)* The ascertained values establish a norm for the particular place Changes over the years are significant as they indicate improvement or worsening of the situation Because this is the first occasion on which these rates have been established for American Samoa, they have value only as a base line with which future findings may be compared.

Type rate Ten of the case records do not indicate the type of disease found The type distribution among the other 35 patients is shown in table 2

Age rate The age distribution of the patients at the time of diagnosis is shown in table 3 The rate for persons less than 15

(13) S foot ot f r nc *(11)* pp 13 17

years of age is 15 5 per hundred Leprosy was recognized chiefly among youths and young adults

Sex rate Of the 45 patients 23 were male and 22 female

TABLE 2 *Typ / l pro y t d*

Type	Numbe	Pe t
L p mat	18	51 4
T b r ul d	14	42 8
Un h acter ti	3	5 8
Tot l	35	100 0

Race incidence The population of American Samoa is composed of Polynesians Caucasians and so called half castes Thirty eight of the patients were Polynesian and 7 were of mixed Polynesian Caucasian ancestry The small Caucasian population consisting mostly of naval personnel and their families has as far as is known remained entirely unaffected.

TABLE 3 *Ag d t b t n / p t t*

Ag g p (y)	Numb
5 9	1
10 14	6
15 19	12
20 29	15
30 39	3
40 49	5
50 59	1
60 nd e	2
T tal	45

Class incidence Samoan society is classless There are however a few persons engaged in mercantile pursuits or holding superior positions in the government who with their families are relatively affluent. That such status has not protected them from leprosy is shown by the fact that 4 of the patients were members of such families

Contact rate Twenty eight patients probably acquired leprosy as a result of household contacts and 12 as a result of extra familial contacts In 9 patients the contact relationship was unknown (cases 1 9 and 3 are omitted from this consideration)

This gives a [illegible] rate of 6.4 per hundred and an extrafamilial rate of 3.6 per hundred.

General incidence The number of the known patients were living at the time of writing. This gives a general incidence of 1.94 per thousand. The relatively high lepromatous rate and the low childhood rate suggest that general community hygiene is good and that the disease is on the wane. Although increasing population bears out good community hygiene (it increased from 5,679 in 1900 to 15,602 in 1950), the recently observed increase in the number of patients with leprosy indicates waxing rather than waning of the disease. Several years of observation will be necessary before a trend can be demonstrated.

CONTROL MEASURES

Measures for the control of leprosy include (1) creation of a community consciousness of the problem, (2) case finding, (3) isolation of the contagious, and (4) treatment (*14*).

Community consciousness An enlightened community will not tolerate an unnecessary disease. Although American Samoa is in a transitional stage of social organization, the community is already aware of the importance of leprosy. In 1950 when a Samoan Committee undertook to raise funds for Christmas gifts to the leprous patients, 1,081 donors, (about 1/10 of the adult population) responded. This indicates a popular interest in the problem which needs only intelligent guidance to be highly useful in the control program. One of the objectives of the Committee was the molding of such effective public opinion. Public Health Department planning must take account of this important factor.

Case finding The positive phase of leprosy control includes the early detection of the patient at a time when treatment is most likely to be effective and when the danger to the public health is least. The case-finding methods locally applicable include an extensive survey in the form of the legally required annual physical examination of school children and the examination of contacts of known patients.

The school population was subjected to a physical examination a deliberate part of which was a search for leprosy. The number of children examined was 4,325. Although no leprosy was found, 3 children were admitted to the hospital with leprosy, in each case ahead of the examination of their particular schools. These facts almost certainly indicate the urgent need for a screening test for leprosy comparable to the tuberculin test.

(14) See [illegible] (*11*) p. 143.

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tedious ly long duration All patients, therefore, deserve a chance to have local liberty while under treatment, especially children who deserve a chance to go to school and to develop normally with their contemporanes The creation of a suitable leprosarium in islands with a total population of 18 602 is economically out of the question, and the available isolation facilities are no more than those of a receiving and holding station There fore since 1944 selected patients have been sent to the Central Leper Hospital at Makogai, Fiji, an institution equipped to serve the needs of the South Pacific area in general Located on large island in surroundings similar to those of Samoa Makogai offers ample space, air and occupation to the patients All patients with lepromatous and uncharacteristic lesions are sent to Makogai as soon as possible after diagnosis Those with tuberculoid lesions, owing to their generally lesser infectivity are individualized according to bacteriologic and epidemiologic criteria Patients who are bacteriologically positive and who will probably require prolonged treatment are dispatched to Makogai Patients with mild leprosy who are bacteriologically negative are assigned to outpatient treatment and observation They are subject to hospitalization should circumstances require Patients discharged from the leprosarium are also subject to re-examination

The wisdom of permitting any patient to go at large except after prolonged isolation, is open to question In Samoa it is an idle gesture to interdict contact with children or even marriage and the procreation of children, all potential future cases Nevertheless, it must be admitted that outpatient treatment is accepted good practice *(16)*, and that it is psychologically sound Furthermore it is evident that patients are more likely to report early for treatment if they know that diagnosis does not necessarily mean prolonged isolation The choice is between two evils, with nonisolation of suitable patients with tuberculoid lesions as probably the lesser

Treatment Although a discussion of epidemiology is not an appropriate place in which to comment on treatment, the improved outlook in leprosy due to the sulfone drugs is significant from the point of view of the public health To some extent these drugs justify occasional outpatient treatment and observation Their exact value epidemiologically remains undetermined *(17)*

COMMENT

From the foregoing it is evident that the main foci of leprosy in American Samoa are known and that leprosy control must be

(16) See footnote reference *(11)* p 162
(17) Austin, C J Use of Sulfones in Leprosy *First Conference of the Leper Trust Board* (New Zealand) Christchurch 1950

centered about them With increasing public appreciation of the importance of the problem with available means for proper isolation and with the use of repeated contact examinations and annual examinations of school children the outlook is hopeful Austin *(17)* has pointed out that for the next few years the population at leprosariums is likely to increase but that eventually a decline should be apparent. This is the expected course of events in American Samoa

SUMMARY

Leprosy is a major public health problem in the islands of American Samoa The morbidity is 1 94 per thousand The character of the disease is presented as a base line for future comparisons

BOOK REVIEW

Body T mp rature It Ch g w h En m t D d Th py by W *A S II* Ph D P f sor of B phy s d Phy l gy U y f Cal for M d l Scho l L A g le Cal f Am L cru e Se P bl t N 147 A M g ph Am L t Phy l M d ci Ed t d by W *A S II* Ph D Pr f or f B o- phy d Phy l gy U t ty of C l f rn M d c l Sch l A g l Cal f Form ly P f or f M d l Phy d D f P tg d t C ur t Phy l M d U t ty f/ M d al B h G l t T 112 p ge ll tr t d Ch/ Th ma P bl h Sp gf ld Ill 1952

This book is primarily designed for physiatrists I author presents the classical physiology of heat and col tion and of the effects of thermal variation on the fortunately publishing time lags apparently have s his presentation that many of the newer concepts ar In the compilation of this monograph for high lev students and aspirants for certification by the Am of Physical Medicine several references were eith arbitrarily omitted as interjecting impertinent or theres In pite of the fact that 22? references book cannot be regarded as a complete compendium for the scientist, researcher or advanced st temperature — 1 *H Lawton M D*

ROENTGENOGRAPHIC SIGNS OF INTESTINAL PARASITIC INFESTATION

A Case Report (1)

LEWIS E ETTER M D (2)

LAWRENCE C CROSS (3)

IN the course of a gastrointestinal series performed on an American veteran of the Korean campaign who had a shell fragment in his abdomen, no abnormality was noted in the stomach or duodenum During inspection of the roentgenograms of the small bowel, our attention was drawn to an abnormal, thin, comma shaped collection of barium in the left lower abdominal quadrant on the 6 hour film (fig 1) We then looked over the remainder of the roentgenograms and saw a linear shadow of lessened density on both the immediate and the 2 hour films, one of which corresponded quite well with the position of the radiopaque shadow described above, and which was probably in the jejunum (fig 2) We recalled that Carland (4) Weir (5) and Lofstrom and Koch (6) reported on the diagnosis of ascaris infestation by serial roentgenographic examination of the small intestine We therefore made a presumptive diagnosis of infestation of the small bowel, probably by *Ascaris lumbricoides* and asked the patient to return for re examination

A gastrointestinal series was made about 2 months after the first examination and the outline of the body of the worm was then

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(1) Read with the Veterans Administration and published with the approval of the Chief Medical Director The statements and conclusions published by the authors are the results of their own study and do not necessarily reflect the policy of the Veterans Administration

(2) Attending Radiologist Regional Office U S Veterans Administration Pittsburgh Pa

(3) Chief Xray Technician Regional Office U S Veterans Administration Pittsburgh Pa

(4) Garland L H Tentative diagnosis of intestinal roentgenology 44 113 July 1945

(5) Weir D C Roentgen diagnosis of carcinoma of the rectum Radiology 47 284 286 Sept 1946

(6) Lofstrom J E and Koch D A Diagnosis of ascariasis by serial roentgenographic examination of small intestine Am J Roentgenol 57 449-452 Apr 1947



Figure 2



Figur 1

located in the right lower abdominal quadrant (fig 3) A ropelike defect displaced the barium in the ileum and conformed to the presumed shape of a round worm A complete blood count was made on this man at each visit but stool examinations were not done No eosinophilia was noted

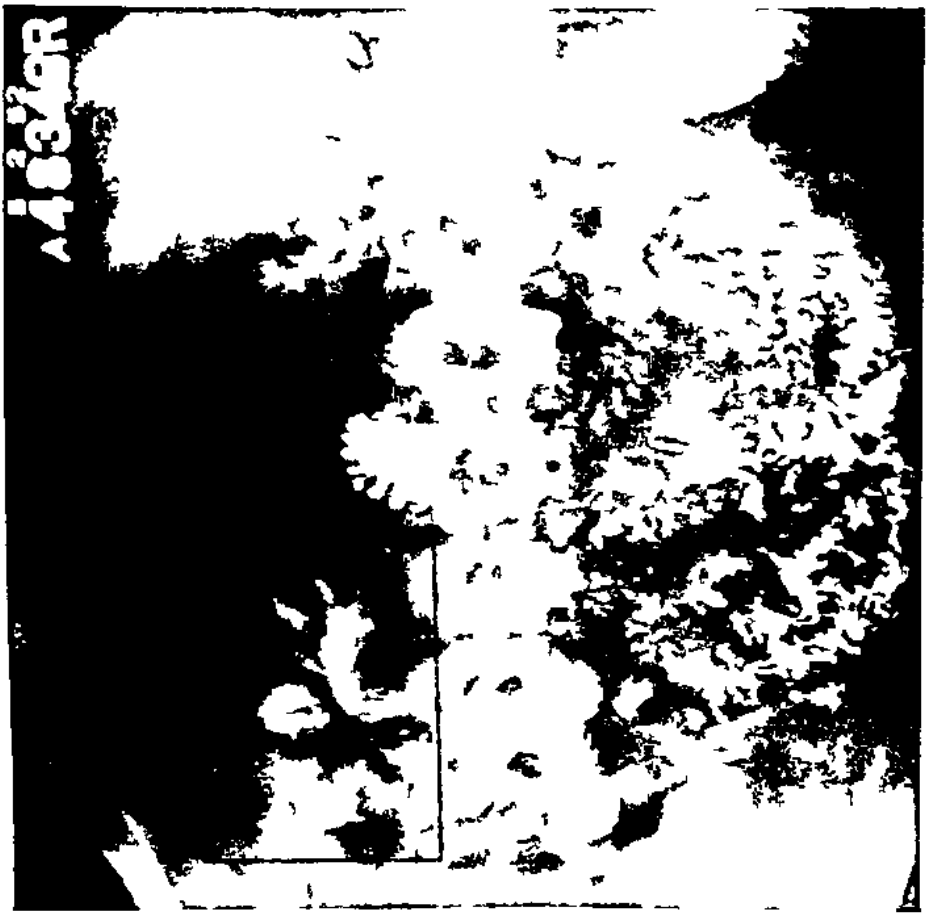


Figure 3

After the second visit the man was given 5 anthelmintic pills each containing 0 2 gm of hexylresorcinol, and asked to watch his stools for evidence of worms He promptly passed a non viable male ascaris measuring almost 11 inches in length and about 1/4 inch in diameter

Comment A filiform collection of barium such as that shown in figure 1 in the left lower abdominal quadrant is suggestive of barium in the intestinal tract of a worm When associated with a linear shadow of lessened density, such as was seen in figures 2 and 3 the diagnosis is practically confirmed Lofstrom and Foch did not see barium within the worm on their 24 hour films Perhaps it had already been evacuated by that time Even without this additional sign, however, the coiled linear filling defect seen in the barium filled small bowel is probably diagnostic of intestinal parasitic infestation

BOOK REVIEW

Pr bl m of Co s ou T t of th Third Conf M ch 10 d 11 1952 N w York N Y d t d by *H ld A. Ab m* M D A oc t Phy f All rgy Mt S nai Hosp t l N w York N Y 156 p g ll t d Spo d by th *J b M y J F d t* pri t d by Corl M cy & C Inc N w York N Y p bl h 1952 Pr $3 25

This conference with an all star cast as usual discussed 3 topics I ety in the chapter entitled "Consciousness and the Metabolism of the Brain told of the machinery of be havior in a semitechnical fashion using mechanical thermal chemical and electronic models to illustrate the processes of thinking consciousness and behavior The second topic was Hypnotic Phenomena in which Wolberg presented a recording of a hypno-analytic session and a motion picture entitled Un conscious Motivation The latter consisted of a hypnotically induced conflict simultaneously produced in a man and a woman They were subsequently induced hypnotically to dream day dream look at Rorschach blots and TAT cards and to respond to word association cues Together they analyzed the content of the conflict but there was a significant difference in the approach of the man and of the woman to their guilty memories the woman tending to lay the blame on the man

Monnier in an important paper on "Experimental Work on Sleep and Other Variations of Consciousness introduced the definition of consciousness as a system which transcribes into si ns philosophic patterns elicited in the sense organs and in the brain by outer physical events and stated that these signs express relationships between outer physical events and they have a signification for the individual There was a great deal of discussion of various types of cerebral ablation and Monnier presented the hypothesis that there is more transporta tion of signs than has been previously assumed and that at subcortical levels there are probably some "integrative codified evaluatory functions The discussion throughout was keen and provocative It raised many more questions than were an swered The volume emphasizes the worth whileness of inter disciplinary research and communication This book should be of special interest to physiologists neurologists psychiatrists psychologists and other students of human bel avior

—Lt (jg) F 1 Loomis Jr MC USNR

EXTENSIVE RUPTURE OF SPLEEN WITH DELAYED SIGNS OF HEMORRHAGE

CHARLES ATAMIAN *Captain USAF (MC) (1)*
JOHN McFARLANE *First Lieutenant USAF (MC) (1)*
HENRY S BLAKE *M. D. (2)*

THE syndrome of delayed hemorrhage following traumatic rupture of the spleen was first described by McIndoe *(3)* Since that time only small series of patients with this syndrome have been noted Zabinski and Harkins *(4)* reported 4 patients with hemorrhage delayed from 4½ to 7 days (with 1 death) In Dobson's *(5)* series of 22 patients signs of delayed hemorrhage occurred in 5 In our patient, 8 days elapsed before splenectomy was performed for a rupture measuring more than 5 cm in depth and width

CASE REPORT

A 36 year-old man was admitted to a civilian hospital following a 4 car collision in which he suffered a concussion and contusion of the brain and a fracture of the right clavicle Shortly after admission he regained consciousness but remained dazed and disoriented for several days His only complaint during this period was pain in the region of the clavicle and diplopia His left pupil was larger than his right but both reacted to light The remainder of the neurologic examination was negative but a subdural hematoma was suspected and the patient was placed under observation Palpation of his abdomen revealed no tenderness or mass Thirty six hours after the accident his condition was considered satisfactory and he was transferred by ambulance to this hospital, a distance of 28 miles

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(1) U S Air Force Hospital Forbes Air Force Base Topeka Kansas
(2) Consultant to the Surgeon Forbes Air Force Base Topeka Kansas Surgeon Topeka Medical Center Topeka Kansas

(3) McIndoe A H Delayed hemorrhage following traumatic rupture of spleen Brit J Surg 20 249-268 Oct 1932
(4) Zabinski E J and Harkins H N Delayed splenic rupture clinical syndrome following trauma report of 4 cases with analysis of 177 cases collected from literature Arch Surg 46 186-213 Feb 1943
(5) Dobson L Rupture of spleen with particular reference to delayed hemorrhage Brit J Surg 38 409-417 Aug 1950

No change occurred in his physical condition vital signs or laboratory findings until the eighth day following the accident when he began to feel faint His pulse rate suddenly increased from 80 to 110 his systolic blood pressure dropped to 90 and a red blood cell count of 2 6 million was recorded Following a transfusion of whole blood his vital signs returned to normal He complained of dull abdominal aching unassociated with nausea vomiting or change in bowel habits Examination again revealed a dilated left pupil without other neurologic signs His abdomen remained soft but there was tenderness in all 4 quadrants on deep palpation There was no bulging of his flanks but shifting dullness indicated the presence of fluid in the abdominal cavity

A diagnosis of ruptured spleen was made Two additional transfusions of 500 cc of whole blood were given and a laparotomy was performed On opening the peritoneal cavity about 1,500 cc of fresh and clotted blood were found in the pelvis subhepatic area and the splenic region No laceration of the liver was seen but a ruptured spleen was detected by palpation The incision was enlarged and the spleen removed The postoperative course was marked by an atelectasis of the lower lobe of the right lung This rapidly responded to treatment without the necessity of bronchoscopy

DISCUSSION

This episode on the eighth day following injury indicated severe bleeding The hemorrhage was believed to be limited to either the peritoneal cavity or the retroperitoneal space because there was no evidence of bleeding from the gastrointestinal tract kidneys or the cranial or chest cavities The absence of back pain and the outline of the psoas shadows on a roentgenogram of the abdomen did not support retroperitoneal hemorrhage A preoperative diagnosis of intraperitoneal hemorrhage with probable rupture of the spleen was made The well formed clots encountered at operation in the region of the rupture are believed to have prevented early profuse hemorrhage Delayed hemorrhage can also result from rupture of the capsule following subcapsular hemorrhage

DELAYED RUPTURE OF THE SPLEEN

A Case Report

PAUL J KOWALIK, Jr Major MC USA (1)

A 21 year old soldier was admitted to this hospital on 19 October 1952 He gave a history of sudden onset of mid abdominal pain coming on immediately after his noon meal, associated with weakness, profuse perspiration, and nausea but no vomiting When first seen, he complained of a generalized dull abdominal pain, aggravated by motion, which also caused a pain deep in the back of his neck on the left side The neck pain bothered him as much as the abdominal pain and he lay in bed with his head elevated on a pillow, turned to the left side supporting his neck with his left hand Movement of the neck both active and passive, aggravated the pain

His abdomen was moderately rigid, markedly tender, and rebound tenderness was slightly worse on the left Almost continuous peristaltic sounds of normal character were heard He was afebrile, his pulse was 80, and his blood pressure was 116/74 His leukocyte count was 10,900 with 80 percent polymorphonucleocytes His hemoglobin was 10 5 grams A flat roentgenogram showed no significant findings

Further questioning elicited the fact that the patient had been boxing 2½ days prior to admission and had sustained a severe blow on the left side of the back during the second round of a 3 round bout He completed the fight without difficulty and was not particularly distressed by the blow Between the time of the blow and his collapse, he was completely asymptomatic

Much attention was given to the patient's neck pain A complete neurologic examination was negative except for the pain on flexion of the neck A decision was made to explore the abdomen because the evidences of peritoneal irritation were unmistakable and because of the low hemoglobin The left upper abdominal quadrant seemed the most likely site of disease with a preoperative diagnosis of ruptured spleen or ruptured left lobe of the liver The blood free urine and normal temperature were considered reasonable evidence of a normal left kidney Lumbar puncture was performed the spinal fluid pressure and character

(1) U S. Army Hospital Camp Chaffee Ark

On page 73 the use of podophyllin in treatment of condyloma acuminatum is discussed The danger of podophyllin in its action on contiguous tissues and protection of adjoining normal surfaces to prevent pain and edema should be mentioned The physician may be embarrassed when a dorsal slit becomes necessary because of the extreme reaction of the prepuce when podophyllin is used on a rosette of condylomata about the corona and coronal sulcus Furthermore podophyllin is of little use in the treatment of keratotic condyloma. On page 361, the Davis method of administration of iron cacodylate and coagulen is mentioned. The dosage and frequency of administration should have been stated More cross references would have enhanced the value of the book Although it is not feasible to repeat the full directions each time a medication is recommended, such a reference to the appropriate page number where it is adequately described would be desirable or an appropriate page designation in the index would be handy

This book is not recommended as a full text on dermatology It is recommended for its completeness relative to therapy and is a useful book as an adjunct to one of the larger texts

—*Capt W N Vel MC USN*

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FOREWORD

Th *U t d St t Arm d Forc s M d al J urn l* th medi m for d m ti g f rm t on f dm tr t nd prof l t t t ll m d c l pe on l f th Dep tm t f D f Th A t t t h Se t ry f D f (H lth d Med l) nd th Surg Ge er l f th l rv all med l ff d t l off Med l Serv c Corp ff N C p off nd ff of h V t ary Corp f th Arm d For nd th med l on It t f th Army N vy nd Air F rc t bm t m pt f publ t on in th *J ur l*

MELVIN A CASBERG M D
A ta t t the S cr t ry f D f
(H alth a d M d l).

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Monthly Message

The Secretary of Defense has appointed an Assistant to the Secretary of Defense with responsibility for all health and medical matters within and involving his Department This newly created office has organizationally replaced the Armed Forces Medical Policy Council effective 1 April 1953

I have been appointed as Assistant to the Secretary of Defense to carry on as his advisor in health and medical matters Close liaison will be continued between this office and the offices of the Surgeons General in the interest of coordination with their operational responsibilities in the implementation of general medical policies One of the major changes involved is the creation of an advisory council to the Assistant to the Secretary of Defense consisting of 6 civilian members selected from among national authorities in the health and medical fields of endeavor

Appointments as members of the newly established civilian advisory council have been tendered and accepted by the following nationally eminent men Isidor S Ravdin M D Surgeon in Chief and John Rhea Barton Professor of Surgery at the University of Pennsylvania Alfred R Shands Jr M D Medical Director of the Nemours Foundation Alfred I DuPont Institute in Wilmington Del , and formerly Associate Professor of Orthopedic Surgery at Duke University James P Hollers D D S practicing dentist in San Antonio Tex who is a past president of the National Association of Reserve Officers William S Middleton M D Dean and Professor of Internal Medicine University of Wisconsin School of Medicine Dwight L Wilbur M D Professor of Clinical Medicine at Stanford University School of Medicine and Anthony J J Rourke, M D President of the Hospital Council of Greater New York and former President of the American Hospital Association

Through the office of the Assistant to the Secretary of Defense the medical services will continue to advance in the efficient accomplishment of their combined military missions

Melvin A Casberg M D
Assistant to the Secretary of Defense
(Health and Medical)

THE ARMED FORCES MEDICAL POLICY COUNCIL

REORGANIZATION OF ARMED FORCES MEDICAL POLICY COUNCIL ANNOUNCED

The Armed Forces Medical Policy Council of the Office of the Secretary of Defense was reorganized on 1 April 1953 and has become the Office of the Assistant to the Secretary of Defense, as announced in Dr Casberg's Monthly Message in this issue

The staff of the former Armed Forces Medical Policy Council will continue in the newly created office Some staff reorganiza tion may occur at a future date

III Military Affairs Coordination Division (1)

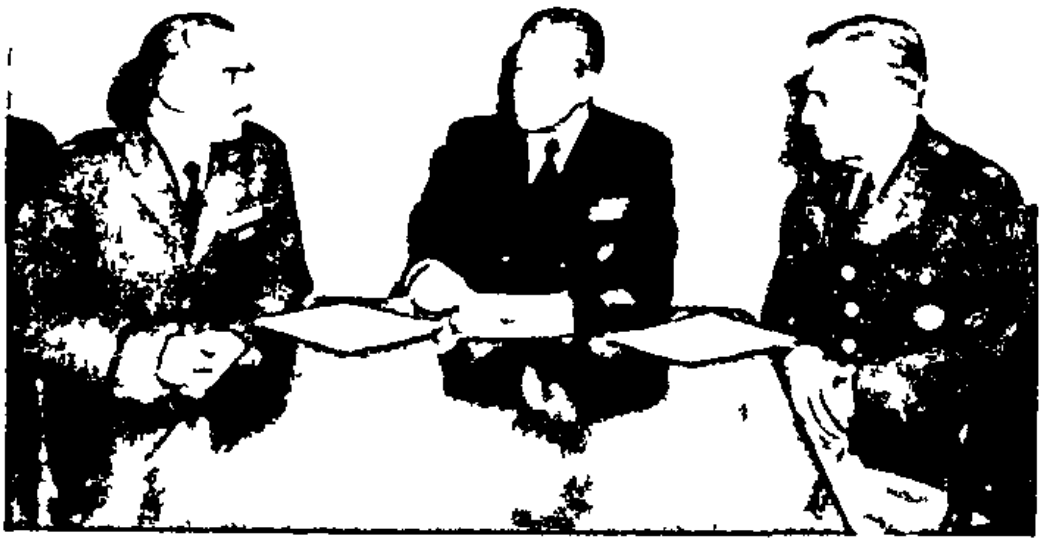
THE Military Affairs Coordination Division of the Armed Forces Medical Policy Council (fig 1) develops, coordinates, and recommends medical and health policies which are currently required for the guidance of the 3 military departments The present medical programs of the military services are con tinuously under review in order to develop uniform programs within 2 or more military departments, initiate joint programs between 2 or more military departments, and establish cross utilization of medical facilities This Division develops stand *ardization of medical nomenclature*, reports, records, technical procedures, and methods for use within the military departments It represents the Council in collaboration with other agencies of the Department of Defense in similar efforts toward uniformity

Another important function of this Division is that of main taining liaison with the Assistant Secretary of Defense (Manpower

(1) Th third of four t cl s on the Armed Force Medic l P l cy Council

and Personnel) advising on all medical manpower problems and requirements for medical and dental officers for the 3 military departments

Many actions have been taken by this Division which will in the end affect persons serving in Armed Forces medical and allied fields Studies have been conducted which will result in uniformity of grade of rank of special registrant physicians



Figur I Military Affair Coordinati Division Armed Force M dic l P l cy Co ncil. L ft t igbt C l I Theodore C. B dwell, J USAF (MC), Si ff A i t nt R a Admiral Job Q Ow ley MC, USN Chief of Di i ion and Colon l William W Ro J MC, USA Si ff Assi tant.

taking into consideration their length of professional experience Uniformity and length of tours of duty and promotion policies within the 3 services have also received action \ recent directive has been issued establishing uniform service requirements following intern hip and residency training A policy has been extended throughout the Department of Defense on the use of registered nurses to assure insofar as practicable that they be used for professional duties only Studies by the division and the committees which preceded it have resulted in the establish ment of the Armed Forces Medical Publication Agency the Armed Forces Institute of Pathology the Armed Forces Epidemiological Board and the Armed Forces Medical Library An experimental program has recently been inaugurated in several medical schools to provide basic military medical education in the curriculum Medical care of dependents of Armed Forces personnel is receiv ing continuous and thorough study

Due to the critical shortage of medical and dental personnel required to care for the health needs of the Armed Forces, the Department of Defense has recently adopted the policy of considering all physicians, dentists, and veterinarians potentially acceptable for military service provided they can reasonably be expected to be productive in the Armed Forces and as a result the military departments were directed to re-evaluate such previously disqualified personnel In addition, studies have been conducted and recommendations made by this Division resulting in proposed revisions of Public Law 779 (the "Doctor Draft Act") for presentation to other agencies of the Department of Defense

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IV Civil and Military Interrelations Division *(1)*

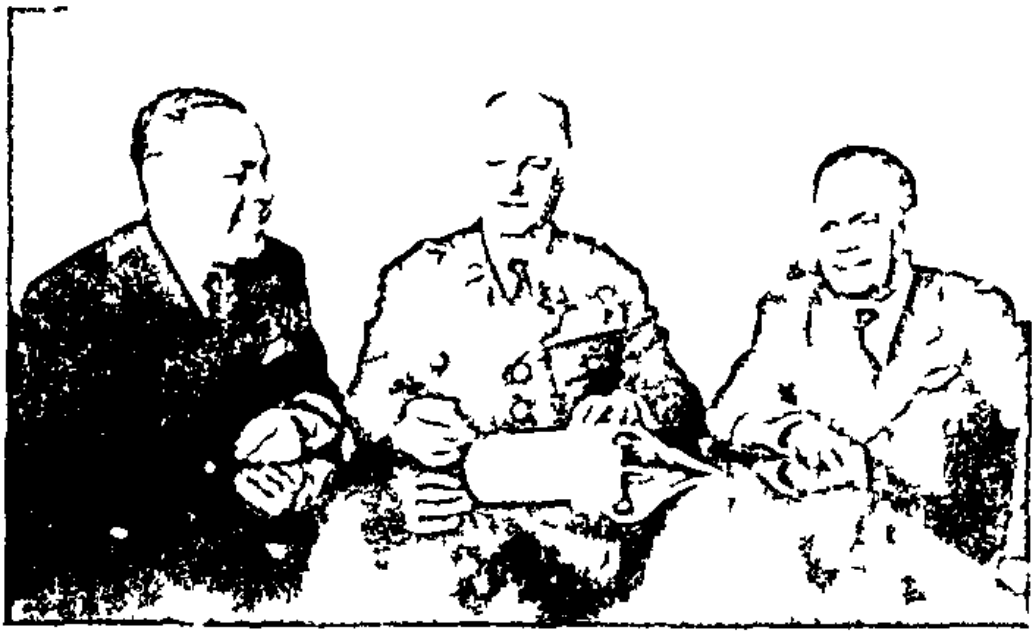
THE Civil and Military Interrelations Division of the Armed Forces Medical Policy Council (fig 1) coordinates and integrates military medical activities with civilian medicine and with governmental agencies outside the Department of Defense Therefore, the mission of this Division requires that most of its activities be directed toward participation in joint studies with other agencies in order that policies reflecting the combined opinions of both civilian and military authorities may be evolved An example of such military medical contribution to national policy is the position of the Armed Forces Medical Policy Council in the National Blood Program The National Blood Program encompasses the Armed Forces Blood Program together with that of the Federal Civil Defense Administration and that of the American National Red Cross This Division also provides the necessary staff studies on which the Council establishes policy for operational procedures of the blood programs of the 3 military departments

Another function of the Civil and Military Interrelations Division is to review and comment on all legislation having military medical and health implications whether such legislation originates within the Department of Defense, any of the 3 medical services, or within Congress

Much of the activity of the Division is a matter of liaison with civilian medical interests and agencies This relationship underlies many of the broad policies concerning the use of medical specialists in the military services Such liaison also provides high level representation for military medicine in problems of

(1) The last of four articles on the Armed Forces Medical Policy Council.

national research and in national health programs Military medical interests are thus represented in the National Institutes of Health the National Research Council and the Armed Forces Research and Development Board In general the Civil and Military Inter relations Division is the agency through which the joint medical



F gur I C l a d Mil tary I t r lat D is on A m d Fo ce M d l I l icy Co cil Left t ight Capt i B j mi G F MC USN St ff As t t B gad G me l Al L Go by MC USA Ch f of D i son d Col I H ry C M I y USAF (MC) St ff A i t t

policies of the Departments of the Army Navy and Air Force are coordinated with the policies and principles of American medicine and with the segments of national interests entrusted to other governmental agencies

BOOK RECEIVED

Syphil t Optic Atr phy by W lt L. Bru t cb M D Clin c l Prof or f N ur l gy nd P ych try Ind n U er y School of Med c ne Cl l D or nd H d f th R ch D partm C t l Stat Hosp tal Ind napol Ind Spe ial Con l t t th U S Publ H lth Serv D v of V l D e s W h gton D C. Am Lectur Se Publ t No 142 A Mon gr ph the B nner ton D f Ame ic L tur in Ophth lmol gy d t d by *Donald J Lyl M. D F A C. S Pr f s of Ophth lm l gy* Coll g f Med ne U er ty f C nn t C nci ti Oh 138 P g s ill tr d Ch rl s C Thom P bl h r Spr gf ld Ill 1953 Pr $5 50

TREATMENT OF PULMONARY COMPLICATIONS SECONDARY TO UPPER RESPIRATORY INFECTIONS[1] [2]

ROBERT DENTON *First Lieutenant USAF (MC)*
ERNEST A KELLER *Captain USAF (MC)*
ARCHIE A HOFFMAN *Lieutenant Colonel USAF (MC)*
JULIAN A JARMAN *Colonel USAF (MC)*

FROM a medical standpoint, acute upper respiratory infections at present have the second greatest impact on the personnel effectiveness of the Air Force As officially reported (3) they are surpassed in incidence only by "injuries and their residual conditions " Respiratory tract infections are second as a cause of time loss from duty for treatment, but are first as a cause of admission to Air Force hospitals During the winter of 1951 1952 at this hospital, respiratory infections were responsible for 2 469 admissions for treatment The average length of hospitalization of these patients was 5 77 days

The attending physicians remarked on the high incidence of a nonproductive cough which persisted after the cessation of initial symptoms and signs of upper respiratory tract disease This implication for involvement of the lower respiratory tract in many of these patients, together with recently reported statistics (3), was responsible for the initiation of the clinical trial of a new continuous aerosol technic known as mist-O_2 gen therapy

APPARATUS AND RATIONALE

Mist O_2 gen therapy as described by Denton and Smith (4) uses a metal nebulizer (fig 1) to generate large volumes of nebulized particles in combination with therapeutic concentrations of oxygen This moisture laden, or supersaturated atmosphere is contained within a small oxygen head tent During ambient breathing the patient's respiratory exchange carries

(1) This project was implemented with equipment supplied by and patents produced with the permission of the Mist-O_2 gen Equipment Division Products Foundry Co Oakland Calif

(2) USAF Hospital Sheppard Air Force Base Texas

(3) Boneff et al Use U S Air Force Med Serv Dig 2 17 19 Dec 1951

(4) Denton R and Smith R Portable humidifying unit large-capacity metal nebulizer Am J Dis Child 82 433-438 Oct 1951

and distributes this moisture throughout the entire tracheobronchial tree Widespread penetration of the mechanically suspended liquid phase insures liquefaction and subsequent expulsion of retained secretions which materially aid in the maintenance of the physiologic drainage of the bronchopulmonary system



F gu I Sid view f mei l mi t O_2 ge web lizer u th oxyge b tt bed N t the aer s l m t

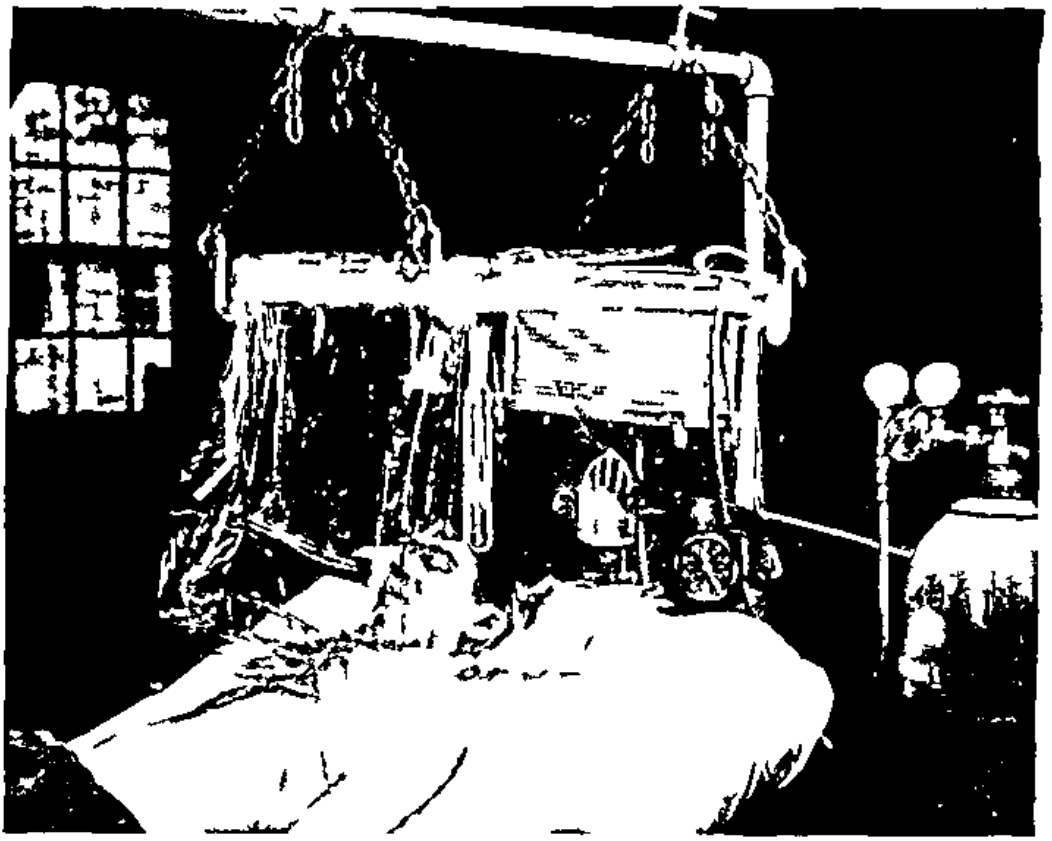
Early experience with adult patients demonstrated the need for certain changes in the design of the open top mist-O_2-gen tent Various positions of the patient in bed were considered necessary to obtain optimum results Consistently high oxygen concentrations were maintained in the pediatric mist-O_2 gen tent because of the gastight seal of the plastic tent material around the child s abdomen *(4)* In the adult, the oxygen seal is formed at the base of the patient s neck In this area, a plastic tent collar to-skin seal is easily secured with a soft elastic bandage which passes under the arms (fig 2) To accommodate the tent



Figure 2. Photograph showing the seal of the plastic tent material around the base of the patient s neck.

to changing positions of the adult patient, the supporting frame which rested on the bed in the pediatric unit, was suspended from a single overhead, supporting bracket by the adjustable 4 point suspension (fig 3) Two small zippered openings are included in the front tent wall to allow access to the patient and to facilitate placement of the patient s head within the tent Temperature control is maintained by an aluminum ice cooler suspended in the

upper rear of the tent enclosure (fig 3) The desired concentration of aerosol is collected initially with the open top of the tent covered with plastic material When the density of aerosol is adequate the top cover except the portion covering the ice cooler may be removed This prevents room air from entering the tent and diluting the oxygen aerosol mixture



F gu 3 Patie t pr par d for t aime t N t posit f the al m m uc c le adjust bl pport g br k t nd pat t h ad w th the t t cl ur

In continuous oxygen aerosol therapy in certain types of bronchopulmonary disease it should be remembered that the normal tracheobronchial tree has both drainage and ventilatory functions Drainage is facilitated by the lengthening and widening of the bronchi and bronchioles in inspiration and by their shortening and narrowing in expiration *(5 6)* Normal ciliary function is essential for this process *(6)* In the presence of infection accumulation of secretions and mucosal edema of the bronchi and segmental bronchioles both play a major role in obstruction of the

(5) Le ne F R nd Kl W S Phys l g l p ory ha g oc a d w h b nchial nf An Ot l Rh & La y g 58 1148-1154 D 1949

(6) Ga hw B d Ba h A L P ll l th py b nch is lung b s nd hr bt h Am J Med 3 261 293 Sept 1947

respiratory tract (7) These factors result in deficient drainage of the tubular system which in turn produces a decrease in the total ventilatory capacity of the lung Progressive obstruction may lead to atelectasis and pulmonary damage By the continuous deposition of aerosol on the bronchopulmonary mucosa, liquefaction and expulsion of secretions and control of edema occur An increase in the total ventilatory capacity follows adequate drainage and optimal conditions for reduction of the inflammatory process are maintained

CLINICAL TRIAL

An initial experience with acute bronchopulmonary infection in adults has been analyzed from a preliminary group of 20 patients with lower respiratory tract inflammation secondary to acute upper respiratory infection Localized pneumonitis and acute bronchitis, singly and in combination are represented (table 1) This group was compared with 20 patients who received similar treatment omitting mist O_2 gen therapy (table 2)

In the treated group, mist O_2 gen therapy was started at the onset of definite lower respiratory tract symptoms and signs The aerosol solution contained 2 5 percent glycerin 2 5 percent propylene glycol, and 0 25 percent phenylephrine in a base of distilled water During a 24 hour period about 1 liter of this solution was nebulized into the head tent enclosure at an average oxygen flow of 8 liters per minute Treatment was continued until the patient was asymptomatic and the chest was clear on examination

RESULTS

Although the average period from the onset of severe symptoms to clearing of the chest in the mist O_2 gen treated group was shorter by 3 days than that for the control group, this difference is not statistically significant The patients receiving mist O_2 gen therapy were rapidly relieved of cough and chest pain The harsh persistent, nonproductive cough was converted within 2 or 3 hours to a loose cough productive of large amounts of thin mucopurulent sputum There was no question in the minds of the observers but that the procedure was clinically worth while

DISCUSSION

At this stage in our experience with adults, it would appear that essentially the same satisfactory response as seen in chil

(7) Hol ng r P Ba ch F P nd P ck H G Influenc f pe tora ts nd pe tora ts nd pe tora ts nd mu c us membranes f trach obr achial tr e J A M A 11 675-675 Aug 30 1941

TABLE 1 *Cl al lt f m t O_2 g n tb py gm t l pne mo ti and a t b ch t*

P t t	Ag (ye rs)	P lm ary mpl t ons	Leukocyt	N ur phil (pe t)	Lymph yt (per t)	Mi t O_2 gen posure (h ur)	D ys eq ur d for l ar g
1	20	P umo t gm t l	8 900	63	36	63	8
2	17	Pn m t gme t l	24 100	70	24	37 5	5
3	22	P m t s gm t l	17 800	70	30	34	7
4	20	P um t egme t l	37 500	72	11	36	12
5	20	P um t gme t l	9 400	66	34	104	16
6	19	P um it gm t l	14 200	88	4	16	6
7	21	P um t gm t l	7 100	60	36	5	25
8	18	P m t gm t l	26 300	89	11	13	6
9	20	P m t egm t l d bro ch t	13 000	78	21	52	14
10	20	P e m t gm t l d br h t t	27 600	83	16	24	8
11	20	P um t gm t l d br h t t	14,200	82	18	64	9
12	21	P m t gm t l d br h t t	13 350	68	26	41	8
13	19	P um t gm t l d b ch t t	10 600	67	31	64	8
14	20	P um t gm t l d br h t	11 700	75	22	60	5

TABLE 1 *Clinical results of mist O_2 gen therapy in segmental pneumonitis and acute bronchitis*—Continued

Patient	Age (years)	Pulmonary complications	Leukocytes	Neutrophils (percent)	Lymphocytes (percent)	Mist O_2 gen exposure (hours)	Days required for clearing
15	21	Bronchitis acute	13 000	82	18	38	6
16	21	Bronchitis acute	9 050	80	10	80	8
17	21	Bronchitis acute	14 850	59	29	22	6
18	20	Bronchitis acute	10 600	80	20	61 5	11
19	42	Bronchitis acute	7 200	65	40	16	2
20	20	Bronchopneumonia	11 700	68	32	85 5	16
						Average	9 3± 5 1

*Standard devi tion

TABLE 2 Cl al li g t l p m t nd t b bt (t l g p)

P t	Ag (y r)	P lm y compl t	L k yt	N t ph l (p t)	Lymph yt (per t)	D y q d for l g
1C	21	P m t gme t l	27 200	89	11	10
2C	22	P t gme t l	13 000	69	31	18
3C	19	P m t gm t l	9 160	61	34	5
4C	21	P m t gm t l	15 000	83	17	22
C	21	P e m tt gme t l	13 400	63	32	10
6C	21	P m gm J	16 700	83	1(	3
7C	20	P e m t gm t l	18 700	80	20	11
8C	18	F m t s gm l	8 400	79	21	7
9C	20	P m t gm l	36 250	89	9	14
10C	19	P m t gm t l	6 500	66	31	9
11C	18	P m t gm t l d b h t c t	12 000	77	22	17
12C	19	P m tt gm nt l d b h t t	13 000	83	17	17
13C	20	l m t gme t l d b ch t t	10 050	70	16	12

TABLE 2 *Clinical results in segmental pneumonitis and acute bronchitis (cont of group)*—Continued

Patient	Age (years)	Pulmonary complications	Leukocytes	Neutrophils (percent)	Lymphocytes (percent)	Days required for clearing
14C	21	Pneumonitis segmental and bronchitis acute	15 000	61	39	11
15C	20	Bronchitis acute	6 200	56	44	11
16C	20	Bronchitis acute	14 200	63	38	13
17C	19	Bronchitis acute	5 450	69	31	5
18C	18	Bronchitis acute	9 300	72	22	14
19C	19	Bronchopneumonia	19 700	72	26	7
20C	23	Bronchopneumonia	18 200	80	15	26
					Average	12 1±5 6

Standard deviation

dren *(4)* may be possible Because of the limitations and nature of this study and the absence of adequate research facilities it was not considered essential to determine the cause (viral?) of these infections

SUMMARY

In this preliminary clinical study 20 patients with bronchopulmonary complications secondary to upper respiratory infections were treated with a new technic in inhalational therapy The clinical response obtained indicates the desirability of more exhaustive studies The treatment produced an apparent shortening of the clinical course of the disease a reduction in hospital days and more rapid rehabilitation of the patient

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BOOKS RECEIVED

Pr bl m f Inf cy and Ch ldhood T t on f th S xth Co f Mar h 17 nd 18 1952 N w York N Y d t d by *M lt J E S* M D S l g P f or of P diatr nd P y h y Y I U ty Sch l f Med N w H C Sp nsor d by th *J h M y J F und t on* N w York N Y 160 pag P d by F nd t Pr In P k na k Lak N J 1953 P $2 50

Mid-Century P y hiatry A Ov w ed t d by *R y R Grink* M D D or f In t tut f P y h m t d P y hiatr R h d T g M ha l R H p l Ch g Ill 183 pag Ch l C Th ma P bl h Sp gf ld Ill 1953 P $5 50

Diabet Ma ual f th D t d P t by *Ell tt P Jo l* M D Sc D Cl l Pr f or f M d Em Her rd M d I S h l Med l D t G g F B k Cl t N w E gl d D s H p l Con ltu g Phy ia B City H p tal H orary P id t In rn t nal D b t F d t Hon ary P d t Am ic D bet A ociat 9th ed t 315 pag Il t ted. L & F b g Ph l d lph P p bl h 1953

Hum n F tor in Air Tra portat Oc p t on l H lth d S f ty by R A M F *l d* Ph D A oci t P f of Indust l Hyg H rv d Sch l f P bl H lth 830 *pag* Il *tr t d* M G w H ll B ok Co In N w York, N Y p bl h 1953 P $13

Sy ovial Fluid Ch ge in Joint D ea by *M rt W R p* M. D A o- t Phy M h tt G l H p l A t Cl al Prof or f M d H rvard M d l Sch l nd *W lt B ue* M D Ch f of M d l Serv M h tt G l H p t l J k P f f Cl l M dic and Dir tor f R b t W Lov tt M m tal Fou d t f th Study f Cr ppl g D H rv d Med l S h l 150 pag ll t t d H rv d U ty P Camb idg Mas 1953 P $4

THE PRACTICAL VALUE OF CARDIOPULMONARY FUNCTION TESTS[1]

ARTHUR A SIEBENS *Lieutenant junior grade MC USNR*
MELVIN M NEWMAN *Lieutenant, MC, USNR*
GRAFTON A SMITH *Lieutenant junior grade MC USNR*
CLIFFORD F STOREY *Captain, MC USN*

THE importance of an accurate assessment of cardiopulmonary function has been greatly enhanced within recent years by the development of therapeutic methods which offer much in the improvement or correction of certain impairments of the heart and lungs As a result, numerous technics applicable to the precise measurement of cardiopulmonary function have been developed These tests have become so numerous, and in some instances so intricate, that their practical clinical value appears to have been fully appreciated only by those intimately associated with the study and treatment of disorders which interfere with the function of the heart lung apparatus The practical clinical value of some of the cardiopulmonary function tests is illustrated in this article by a few selected cases

CASE REPORTS

Case 1 A 47 year-old man was admitted to this hospital in May 1951 complaining of cough, wheezing, and dyspnea of 20 years duration He had had increasing shortness of breath and occasional diffuse chest pain for the preceding 5 years Physical examination showed an obese, markedly emphysematous man who had dyspnea on slight exertion Numerous loud rhonchi and expiratory wheezes could be heard over most of his chest. Roentgenograms showed pronounced flattening of the diaphragm and marked radiolucency of the lungs (figs 1 and 2) The ECG was within normal limits Bronchoscopic examination revealed marked hyperemia, hypertrophy and redundancy of a bronchial mucosa which was covered by thick secretions Treatment with bronchodilators and penicillin resulted in a little improvement.

(1) From the U S. Naval Hospital St. Albans N Y

Figure 1 (1) Posteroanterior chest roentgenogram. Note large diffuse infiltrate in right lung field with obliteration of costophrenic angle and elevation of right diaphragm and adjacent portion of liver.

Figure 2 (continued) (1) Lateral chest roentgenogram. Note large diffuse infiltrate in right lung field with obliteration of costophrenic angle and elevation of right diaphragm.

Comment The results of function tests in this patient are summarized in figure 3 These studies supplement the estimates of the patient s emphysema derived from physical examination and roentgenography They show hyperventilation on exercise and walking, impaired maximum breathing capacity, diminished vital capacity, elevated residual air, failure to reduce the alveolar

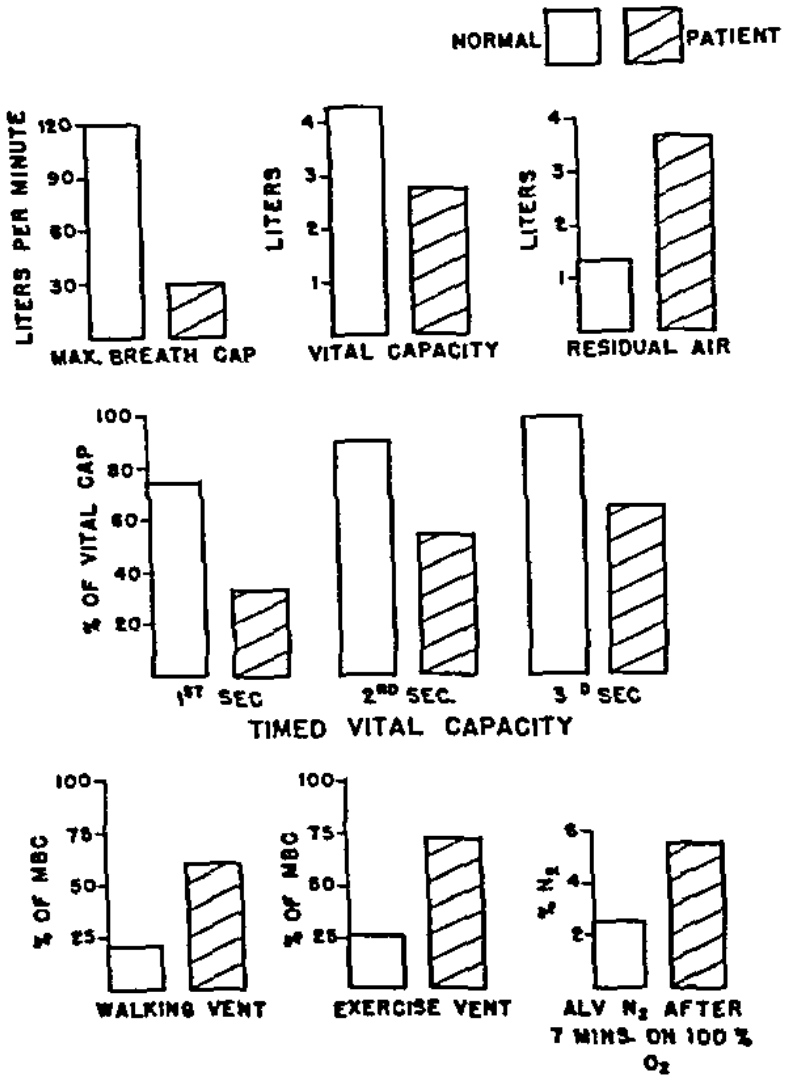


Figure 3 (case 1) Summary of function tests.

nitrogen to normal levels after breathing 100 percent oxygen for 7 minutes, and inability to expel air rapidly as demonstrated by the poor performance on the timed vital capacity *test* These abnormalities form a characteristic constellation, the individual values of which quantitate the elements of overdistention and obstruction which characterize emphysema. In spite of the magni tude of the observed changes, the essential functions of respira tion i e, oxygenation of hemoglobin and removal of carbon dioxide, remained near normal (oxygen saturation 93 percent,

F g re 4 (cas 2) P e per tive roe tge gram of cbe t. Note almost c mplet pa tty of l ft td f ch t d t thick d pl wa d flud Figure 5 (s 2) Roe tg gr m of cb st ft d ort t f l ft t g

CO_2 content, 54 4 volumes percent) As these functions also fail, the present data will become a point of reference for charting the progress of the patient's illness

Case 2 A 20 year old man was in good health until he developed a cold and cough in late March 1952 After ambulatory treatment with sulfonamides he felt temporarily better His fever returned, however and he was hospitalized on 18 April with a

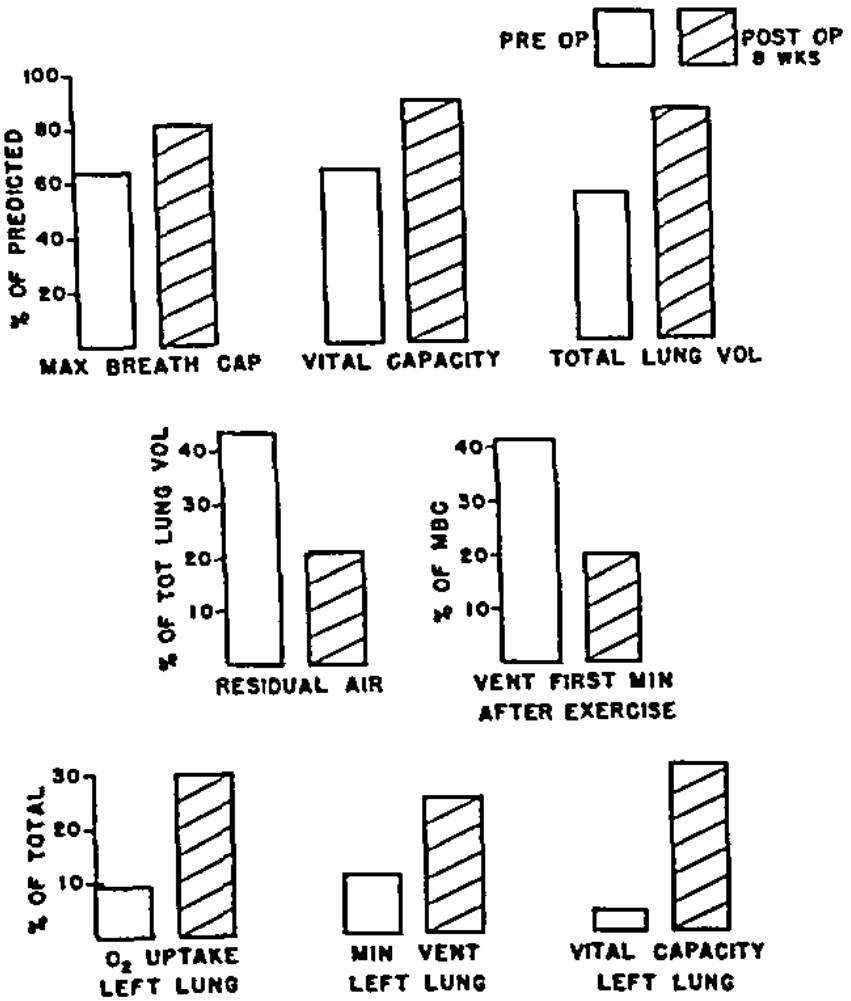


Figure 6 (case 2) Summary of function tests.

temperature of 104° F and pleuritic pain in the left lower portion of his chest. A diagnosis of lobar pneumonia was made After treatment with oxygen and aureomycin he became afebrile, but his chest pain persisted Empyema was then demonstrated by roentgenograms and confirmed by thoracentesis When transferred to this hospital the patient had lost 30 pounds in weight. He noticed dyspnea on moderate exertion It was found that the left side of his chest was flattened and failed to expand His breath sounds were almost inaudible Bronchoscopic examination showed

no abnormality Thoracentesis yielded creamy pus which was sterile on smear and culture for both acid fast bacilli and pyogenic organisms On 12 August a surgical decortication of the left lung and parietal pleura was performed The entire visceral and parietal peel was removed The lung expanded well following operation and there was no further accumulation of fluid Pre- and post-operative roentgenograms of his chest are shown in figures 4 and 5 respectively

Comment The function tests summarized in figure 6 graphically portray the results after cure of the empyema by decortication As in case 1 pulmonary function data were not required for a convincing estimate of the patient s clinical status the physical and fluoroscopic indications of improved ventilation on the left were striking These impressions reflect the increase in maximum breathing capacity vital capacity and total lung volume which were measured In addition a drop in residual air to normal levels indicating restoration of normal pulmonary volumetric relation ships and an improved tolerance for exercise were recorded

Ventilation must be correlated with exchange of respiratory gases if it is to be reasonably evaluated One of the practical problems of current interest concerns precisely this question Is there a return of blood flow and oxygen consumption to a chronically restricted lung the ventilation of which has been restored? The bronchospirometric data demonstrate the benefits of operation in terms of oxygen consumption in the re-expanded lung of this patient. It is therefore in providing an objective basis for evaluating therapy according to both ventilation and oxygen consumption pre and post-operatively that pulmonary function tests have been of assistance in the study of this patient

Case 3 A 25 year-old woman had had known pulmonary tuberculosis since 1947 After several types of therapy a right pneumonectomy was performed in September 1950 for a destroyed right lung The operation was followed by a persistent bronchopleural fistula and empyema The latter was only partially controlled by thoracoplasty and the fistula remained open After admission to this hospital bronchoscopy and bronchography (fig 7) demonstrated long bronchial stumps and a fistula from the right upper lobe bronchus After adequate function of the left lung had been verified and normal arterial oxygen saturation found a reamputation of the right main stem bronchus and a Schede thoracoplasty were performed Because of this patient s dubious clinical status a major operation would have been undertaken only with reluctance had not the presence of adequate respiratory function in the residual lung been established preoperatively The operation was well tolerated and there has been no post operative respiratory embarrassment.

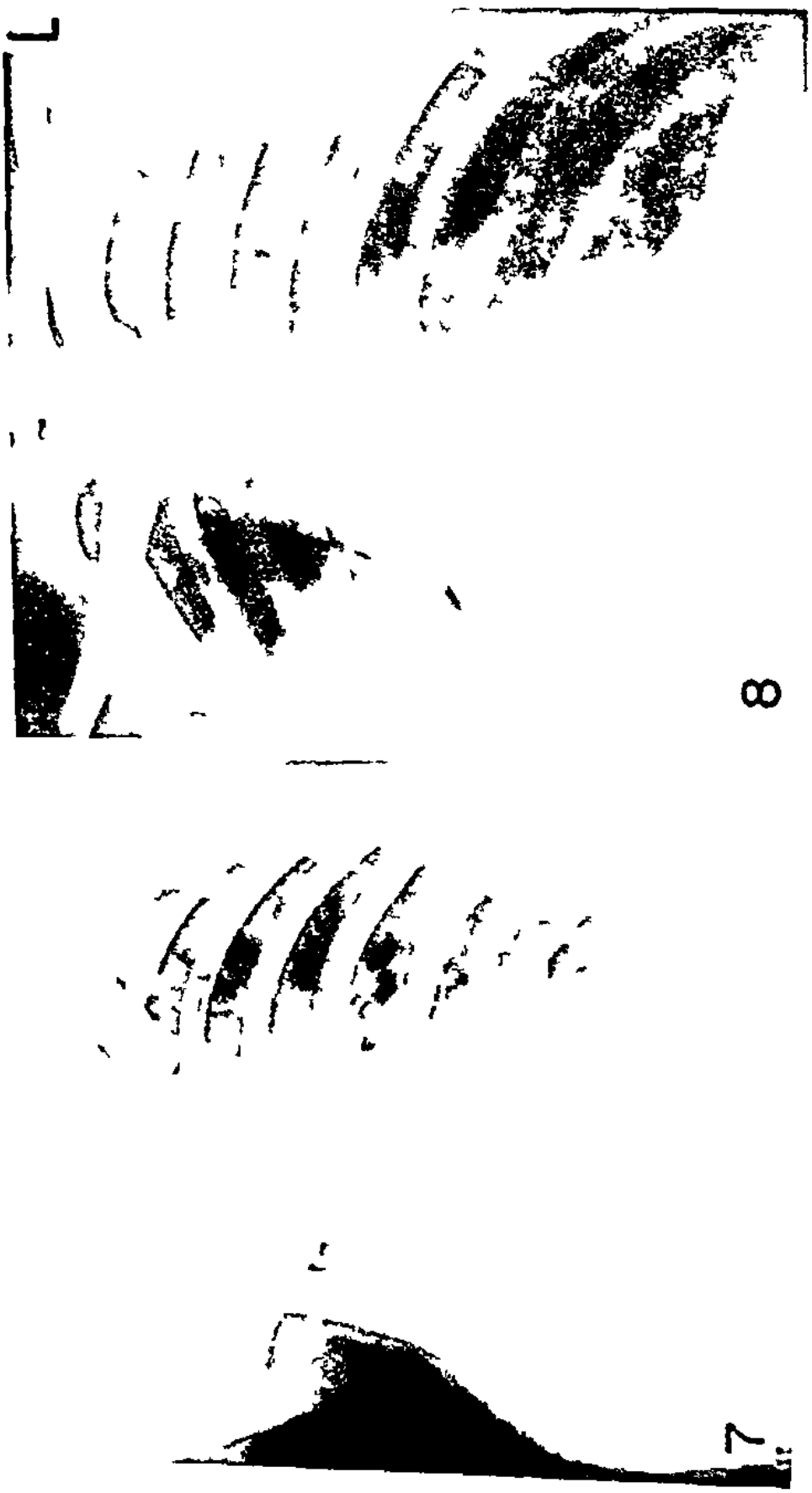
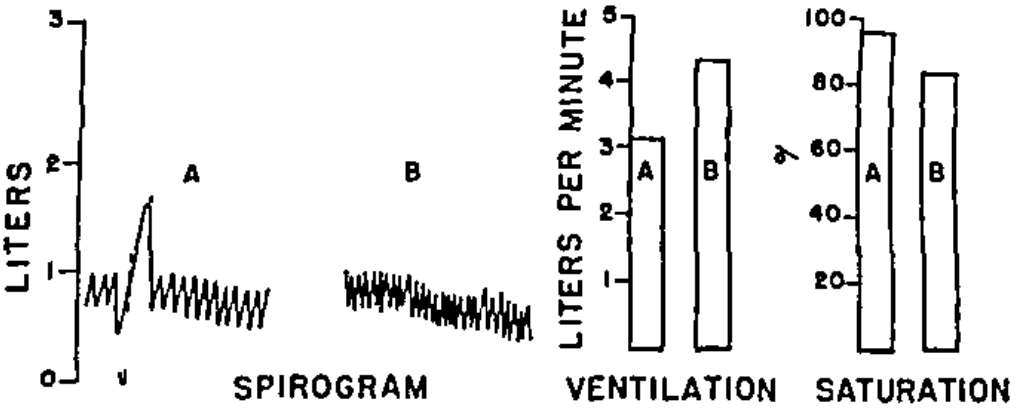


Figure 7 (case 3) Posteroanterio roentgenogram The left lung appears normal The stump of the right stem bronchus filled u ith lipio dol can be seen only faintly Figure 8 (case 4) Roentgenogram of chest There is complete collapse of the right lung with right pyo pneumothorax The left lung shows little residual abnormality after the extensive recent bronchopneumonia

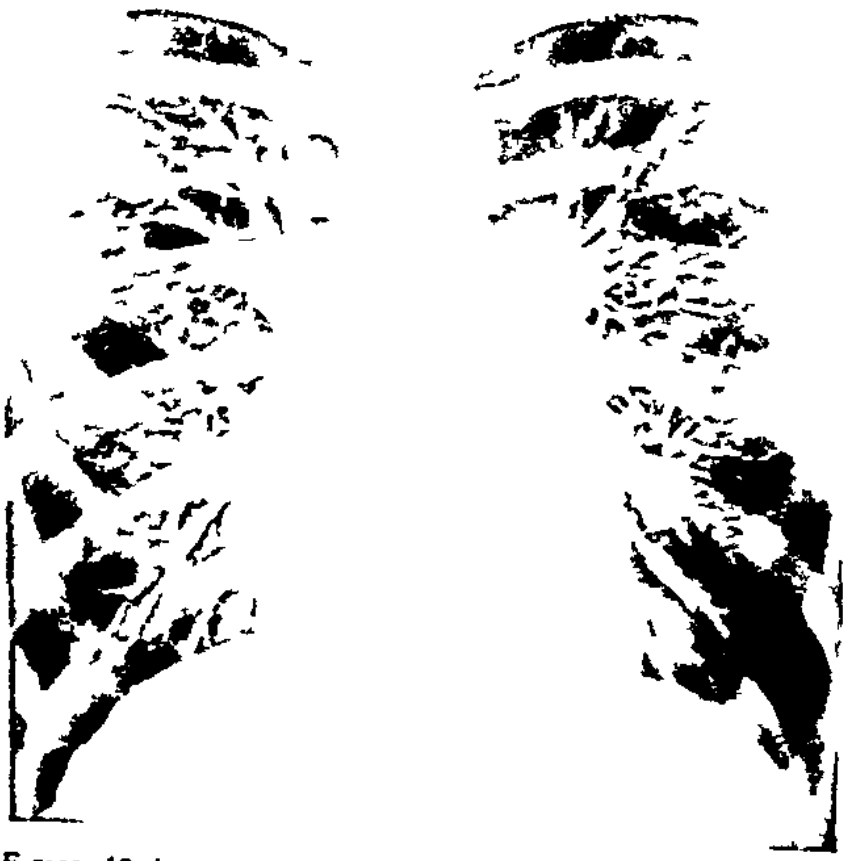
Case 4 A 24 year old man developed a diffuse bilateral bron chopneumonia on 1 September 1952 while under treatment else- where He failed to improve on antibiotic therapy and developed massive atelectasis of the right lung with marked dyspnea and cyanosis Bronchoscopy on 10 October failed to demonstrate



F gur 9 (a 3 and 4) Compar f f cti t ts A a 3 B a 4 D ti d curve i pi ogram A d l mits insp atory nd xp tory x ur ion ormal pe of ame s x ag a d he ght Not ormal tural p t of pro d d m t th vol me N t s tur t on B alth gh ve t latio i mc d A Body wf a a f the t p t t w c mpa abl

intrabronchial obstruction On the day of bronchoscopy he devel oped a spontaneous pneumothorax which was treated by closed catheter drainage without re-expansion of the right lung He was transferred to this hospital on 17 October for further treatment. Repeated bronchoscopies showed no intrabronchial obstruction to account for the persistent atelectasis There were copious purulent secretions coming from the left main stem bronchus and a smaller amount of pus on the right side On bed rest, oxygen supplied nasally and antibiotics he improved somewhat His left lung remained clear on x ray (fig 8) His arterial blood was found to be from 83 to 86 percent saturated on room air (fig 9) and rose to 100 percent on 100 percent oxygen Because of the danger of spreading infection both in his unexpandable appar ently destroyed right lung as well as in his apparently function ing left lung a right pneumonectomy was performed on 6 November Difficulty in maintaining good oxygenation was encountered early in the course of the operation Near the conclusion of the procedure his color became progressively worse his heart slowed and his blood pressure failed Despite intra arterial transfusion cardiac massage and other supportive procedures he died At autopsy there was massive bronchiectasis and extensive atelec tasis of the left lung The excised right lung showed total bron chiectasis

Comment The problems presented by cases 3 and 4 were similar in the following essentials (1) both patients, in effect, had suffered the complete loss of one lung; (2) in each the remaining lung was functioning well as judged by clinical evaluation and (3) thoracotomy on the diseased side was considered necessary for the improvement of each patient and for the preservation of their intact pulmonary tissue They differed in one salient respect. patient 3 had a normal oxygen saturation but patient 4 remained unsaturated on room air Inasmuch as this unsaturation could oe corrected by high concentrations of oxygen, it could be ascribed to impaired diffusion on the left rather than to perfusion of inadequately ventilated alveoli on the right (shunting effect) The findings at oronchoscopy and necropsy were compatible with this impairment Had this patient s diffusion characteristics been normal, as they were in patient 3, he should have withstood the operation uneventfully In this comparison of 2 similar patients, then the critical factor in an analysis of their contrasting outcome was the evidence of pulmonary pathology afforded by a laboratory determination of the arterial oxygen saturation



F gure 10 (case 5). Bronchogram showing extensive bilateral t bular bronchiectasis involving left lower lobe lingula of upper lobe and basilar segments of r ght lower lobe

Case 6 A 22 year-old man was admitted to this hospital in August 1952 for repair of recurrent inguinal hernias In the course of his evaluation it was learned that he had had a chronic cough for many years with production of about 30 cc of thick green sputum daily Bronchograms revealed bilateral cylindrical bronchiectasis involving the right middle lobe and basilar segments of the right lower lobe the lingula and almost all of the left lower lobe (fig 10) Bronchoscopy showed thick mucopurulent material coming from the bases of both lungs (somewhat more copiously from the right) Further questioning revealed that this man had noted increasing dyspnea on relatively mild exertion

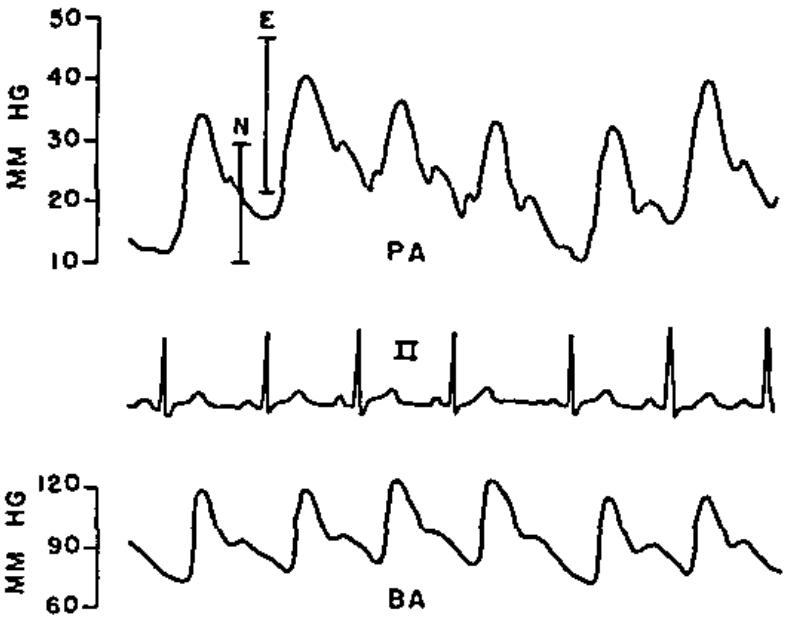


Figure 11 (case 5) The upper contour shows pressure and pulse contour in the pulmonary artery (PA) at the level of the tricuspid valve Normal limits of systolic pressure at this level and diastolic pressure at this level are indicated by N Patient's mean systolic and diastolic pressures on exercise are indicated by E The middle tracing shows lead II of the ECG The lowermost curve shows pressure and pulse contour in the brachial artery (BA) Note elevation of PA pressures at rest and exercise effect of premature contraction (ventricular arrhythmia) and relationship of diastolic interval to pulse pressure.

Comment The results of cardiopulmonary function studies of this patient were critical in determining the choice of therapy That the patient was somewhat emphysematous and moderately prone to exertional dyspnea could be deduced on clinical grounds As in case 1 however the laboratory contributed quantitative data and a point of reference in assessing the degree and progress of disease The findings of unsaturation not clinically detectable

added much to the gravity with which the patient's condition was regarded and raised the likelihood of pulmonary arterial hypertension Finally, the catheterization data completed the basic information essential to conclusive thinking relative to the therapeutic regimen

As indicated in figure 11, the suspicion of pulmonary hypertension was borne out by pressure elevations both at rest and following a level of exercise sufficient to increase cardiac output only 155 percent *(2)* Inasmuch as pressure is inversely related to cross section area in a hydraulic system such as the lesser circulation *(3)*, and as the extent of pulmonary resection required for effective surgical treatment of this patient's bronchiectasis would severely diminish this area, it was concluded that such a course could be pursued only at the grave risk of increasing the hypertension to prohibitive levels The patient was therefore referred to the medical service for conservative management

SUMMARY

The practical value of selectively applied cardiopulmonary function tests in assessing clinical problems has been shown by 5 illustrative cases Physiologic functions that can only be estimated by clinical methods can be quantitatively determined by procedures such as cardiac catheterization, yielding information of crucial importance for diagnosis and therapy

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(2) Normal persons undergoing exhaustive exercise withstood 300 percent increments of cardiac output without elevations of pulmonary arterial pressure (data from Dr Cournand's laboratory)

(3) By Poiseuille's law $P = \frac{8LvI}{\pi R^4}$ Where P is the pressure difference between 2 points L and R are the length and radius respectively of the fluid-containing medium, v is the fluid viscosity and I its volume flow per unit time

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BOOK RECEIVED

Group Psychotherapy Studies in Methodology of Research and Therapy Report of a Group Psychotherapy Research Project of the U S Veterans Administration by *Florence B. Poudermaker* Ph D M D Responsible Investigator and *Jerome D Frank* Ph D M D Principal Assistant In collaboration with *Joseph Abrahams* M D *Albert E Dreyfus* M D *Henry S Haas* Ph D *Robert MacGregor* M A *Joseph B Magoun* M A *Helen T Nash* B A *Morris B. Parloff* M A *David Rosenthal* Ph D and *Edith Varon* M A M S 615 pages Harvard University Press Cambridge Mass publishers 1953 Price $6 50

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GASTRIC DIVERTICULUM AND THE TRANSTHORACIC APPROACH

JAMES B SEAMAN *Lieutenant Colonel MC USA*

THE surgical treatment of gastric diverticulum should receive more serious consideration The transthoracic approach in the treatment of a fundic diverticulum or one near the cardia has definite advantages

INCIDENCE

Bralow and Spellberg *(1)* found the incidence of gastric diverticulum to be 0 015 percent of total hospital admissions Up to 1936 no case had been diagnosed preoperatively at the Johns Hopkins Hospital and only 4 were found by pathologists there *(2)* Of 20,000 admissions per annum to the University Hospital, St Louis, Mo , for the years 1942 1952, no case was reported *(2)*; and of 700,000 admissions to Los Angeles County General Hospital (1929 to 1945) only 6 such cases were seen *(3)* The total experience in these 2 large teaching hospitals of almost a million patients included but 6 patients with gastric diverticulum To most doctors, therefore, this entity is encountered but "once in a lifetime "

ETIOLOGY

Suggested causes of this outpouching are weakness, especially that present in the portals provided for arterioles and venules, thinning of muscular layers, regurgitation benign and malignant ulcerations, infection, gastric distention, and perigastritis associated with traction from without In a few patients there appears to be an associated peptic ulcer, irritable colon, or gallbladder disease

DIAGNOSIS

Symptoms and signs Bralow and Spellberg believed that the clinician is primarily concerned with the extent to which existing symptoms are due to the diverticulum, that the symptoms and

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(1) Bralow S. P and Spellberg M. A Diverticula of stomach report of 26 new cases Gastroenterology 11 59-82 July 1948.

(2) Casberg M. A Diagnosis and treatment of gastric diverticula. Postgrad. Med. 11 398-403 May 1952

(3) Casberg M. A. and Martin W P Gastric diverticula Am. J Surg 76. 172 181 Aug 1948

signs are not characteristic that diagnosis is radiologic and gas troscopic that the condition is frequently asymptomatic and the presence of a diverticulum should not be accepted as the sole factor accounting for the patient's symptoms Such symptoms may include belching vomiting heartburn loss of weight epigastric tenderness periodic substernal pain melena gastric hemorrhage weakness vertigo and dysphagia, Ferguson and Cameron *(4)* mentioned the intermittent character of the discomfort Low mid line thoracic back pain probably due to involvement of the pancreas by inflammation extending from the diverticulum has been described by Telford *(5)*

X-ray Of 267 cases discovered during life 249 were found by roentgenography 12 at operation and 6 by gastroscopy *(6)*. Bra low and Spellberg list roentgenographic requirements as follows (1) mobile sac unattached to extragastric tissues (2) well defined smooth shadow noted from various angles (3) generally no tenderness in area of sac (4) demonstration of rugas in neck of sac (5) characteristic location at lesser curvature and posterior wall near cardia (6) retention of barium for from 6 to 24 hours and (7) occasionally ability to empty sac by change of position

Gastroscopy Bralow and Spellberg believed that gastroscopy is required to differentiate a diverticulum from a gastric ulcer Gastroscopy should not be used in a patient with a cardiac diver ticulum because of the danger of perforation but every diag nostic means available should be used when the diverticulum is located in other areas *(7)* The gastroscope is essential when x ray studies fail to differentiate a diverticulum from a benign ulcer an excavated tumor or a postoperative deformity *(6)* Tracey and Colcock *(8)* believed that the gastroscope is useful in the gastric body or antrum but not so in cardiac or fundic areas and that a surgeon capable of exposing this inaccessible area should be available " Definite needs for gastroscopy are to determine if blood may be coming from the diverticulum or else where and to find out whether or not the remainder of the stomach is normal *(9)*

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(4) F gus L K. nd Came C S J D l f ma h nd duod um tr me by invag na and uter Surg Gy & Ob 84 292 300 Ma 1947

(5) T lf d D D rt la f ma h. Canad M A J 50 526-529 J 1944

(6) P lm r E D Ga tr d la Surg Gy & Ob (I na Ab Surg) 92 417 428 May 1951

(7) B w C. H. B R P d Albe R D D I f ma h p f 30 ca and w f l ur Ga troe l gy 12 10-23 J 1949

(8) T y M. L d Col ock B P Ga tr d rt ul m d g d nd c f urg l n. Ga oe l gy 18 165-169 Jun 1951

(9) Wh h us F R d Ma M ll J M. Ga tr d rt ul m, ga tr p b- rva f 2 ca Ga troe l gy 3 13-22 J ly 1944

COMPLICATIONS

Hemorrhage is the most common complication, others being rupture, torsion and gangrene, and possibly malignant degeneration *(7)*

TREATMENT

Medical treatment includes bland diet, antispasmodics, alkalies, gastric lavage, and postural drainage Such associated conditions as duodenal ulcer, irritable colon, and gallbladder disease should be treated *(7)*

The *indications for operation* vary according to the preferred approach to the cardia and the posterior wall of the stomach We believe that the rule of placing the incision over the site of the lesion should clarify the indications and that as advances are made in surgical technic more of these diverticulums will be treated surgically rather than by indirect methods of observation, drugs, and diet.

Many able physicians *(1, 4, 8)* have stated that if a good medical regimen is faithfully pursued and symptoms persist, surgical repair is indicated Others *(7)* have stated that the possibility of malignancy must be eliminated This demands total excision of the lesion including a rim of normal tissue Casberg *(2)* stated that retention is probably the greatest indication for resection Ferguson and Cameron required that symptoms be stubborn and the sac be large There is an alleged inherent tendency for irritative lesions of the stomach to become malignant and, if the lesion simulates malignancy, operation is obligatory This fact and stasis, predisposing to a focus of infection, are the guideposts recommended by Ficarra *(10)* Frank *(11)* having treated a 71 year-old woman with such a lesion believed that recommending operation for all patients is radical advice in a condition "which is usually harmless and nothing more than an x ray oddity in the overwhelming majority " Because of inaccessibility abdominally Lahey *(12)* believed that operation should be performed only as a last resort Michel and Williams *(13)* mentioned peridiverticulitis as an indication for operation That condition may be secondary to a gastric ulcer, which in itself requires prompt resection

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(10) Ficarra B J Gastric diverticulum Am. J Surg. 75 570-574 Apr 1948

(11) Frank L L. Diverticulum of stomach case report. Am. J Roentgenol 52 510-513 N 1944

(12) Lahey Quoted in footnote reference *(13)*.

(13) Michel M. L. Jr and Williams W T Two locular gastric diverticulum treated by surgical extirpation through the abdominal incision Ann Surg 132: 273-281 Aug 1950

Tracey and Colcock *(8)* urged operation when (1) neoplasm is suspected (2) obstructive symptoms are present (diverticulum in distal stomach) (3) ulceration, uncontrollable by medical management is suspected (4) hemorrhage occurs twice without other source or (5) medical treatment has failed

SURGICAL TECHNIC

Advantages of thoracic approach When the diverticulum is approached through the abdominal wall the gastrohepatic or gastrocolic ligament or both must be incised and much retraction and tugging is required to visualize the posterosuperior wall of the stomach as well as to accomplish a repair Even so it may be necessary to open the stomach and search for an ostium In the 5 patients reported by Bralow and Spellberg 3 diverticulums could not be located via this route In the patient reported by Tracey *(14)* the question of malignancy was considered but operation was thought inadvisable because of the inaccessibility of the involved area *Of the 5 diverticulums reported by Walters (15), approached* through upper left rectus incisions 1 was located so high and was so inaccessible that an inversion rather than an excision was performed In this case the postoperative roentgenograms showed no evidence of inversion In a second patient the diverticulum was not found at the original operation (laparotomy)

Paulson *(16)* was the first to use the transthoracic approach to this lesion Of 34 patients undergoing operation for gastric carcinoma one half were approached by laparotomy and the other half by thoracotomy or combined thoracotomy and celiotomy He compared the shock producing effects of both methods of entry The thoracic method was definitely less productive of shock because of the lighter level of anesthesia required and the exertion of less pressure and tension on the large vessels and plexuses Greenfield *(17)* advocated the thoracico abdominal approach because of the accessibility completeness of exposure lessened danger of hemorrhage (the left and short gastric vessels can be divided under direct vision) lessened shock lighter plane of anesthesia, and lessened total amount of anesthetic used The immediate postoperative involution was also less tumultuous A pure transcostal transdiaphragmatic route can be even more advantageous because when dealing with some lesions of the fundus or cardia it is not necessary to go across the costochondral arch

Definitive surgery A nasogastric tube must be in place to deflate and inflate the stomach and the diverticulum, otherwise the

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(14) Tra y M L Ga tr d la Ga troe l gy 1 518-531 May 1943
(15) W l W D rt ul f m h J A M A 131 954-956 July 20 1946
(16) P ul D L T h ga urg ry w h p t f tr h f d culum f ma h J Thor Surg 13 518-522 D 1944
(17) Gr af ld J Ro N E d M nd l W H Ga tr d rtu l Ar h S s 60 65-74 J n 1950

evagination may be missed Inflation is of immense help and may be compared to the value of tension in dissection elsewhere *(7)*

Bralow and Spellberg *(1)* favored total excision with inversion of the stump Aseptic inversion was preferred by Ferguson and Cameron *(4)* Paulson *(16)* recommended the closed method using a clamp Being desirous of removing and not hiding pathologic lesions, of accurate hemostasis, and of approximating normal tissue in layers, we delineate the diverticulum accurately, excise the lesion with a rim of normal wall, achieve hemostasis with fine forceps and ligatures, and close the defect in the mucosa (easily separable in the fundus) with interrupted catgut and the remaining layers with interrupted fine silk sutures The completeness of hemostasis can be further tested by lavage through the nasogastric tube

CASE HISTORY

A 26-year-old woman was seen on 28 May 1952 A diagnosis of probable peptic ulcer was made Her gastric acidity was normal Roentgenograms revealed a diverticulum below the cardia (figs 1 and 2) She was treated medically but by 2 July there was no relief and she was referred for surgical consultation At the time of transfer to the surgical service on 12 July her nausea, pyrosis,



Figure 1 Preoperative roentgenograms showing location of diverticulum. (A) Oblique view (B) Lateral view.

and mild epigastric pain had been present for 6 months She had vomited coffee ground material twice She denied the use of tobacco and alcohol but admitted overindulgence in coffee One brother had an apparently benign gastric ulcer Examination was negative except for moderate epigastric tenderness



F gur 2. P perative oe tg nogram bow g idual bari m i d vert culum.

On 14 July she was operated on An incision was made through the left eighth rib bed Exploration of the left lung chest wall and hilus was negative The pulmonary ligament was divided to facilitate collapse and retraction of the left lung The left hepatic lobe stomach and the spleen could be located by palpation through the diaphragm which was opened The abdomen was explored The superior 4 cm of the gastrosplenic ligament was divided stay sutures were placed in the stomach and the stomach was rotated clockwise through an arc of less than 45 By means of a nasogastric tube the stomach was inflated slightly and gently and the diverticulum was quickly and easily identified on the posterior wall near the lesser curvature, about 4 cm from the cardia The lesion measured 3 by 2 cm and had a neck less than 1 cm in diameter A traction suture was placed at the summit of the lesion and filmy vascular connections were severed Using a scalpel the sac was excised to include a rim of normal mural tissue

Histologic studies revealed the mucosa to be normal and gastric in type, and the muscle component to be only one layer in thickness There was no ulcer, no bleeding point, and no sign of malignant change The gastric incision was closed and it was determined that closure had not embarrassed the stomach or cardia The stomach was then released to regain its normal habitat. The diaphragm and chest wall were closed around a thoracostomy catheter Every 30 minutes during operation the lung was fully expanded and prior to chest wall closure the pleural cavity was thoroughly lavaged At the time of closure, intercostal block with efocaine was induced

Because of sensitivity, no chemotherapeutic or antibiotic agent was used The patient was discharged on 22 July In August she complained of pyrosis and was admitted to the hospital on 11 September An internist stated that her symptoms were not due to the gastric diverticulum because they had remained unchanged postoperatively and that the operation may have been harmful in that it reinforced the idea that she had something seriously wrong She was discharged after 2 days' observation In October she came to see me and said that she was a "new woman," and had gained 12 pounds She was improved in every way and there was no doubt of her sincerity There was no intercostal neuralgia and no symptoms of pleural irritation Chest expansion was unimpeded and symmetric

CONCLUSIONS

More lesions of organs located under the diaphragm should be explored and treated at an earlier date The transthoracic or thoracico abdominal approach is strongly advocated Surgery is diagnostic, prophylactic, and therapeutic and it is indicated in most patients with a gastric diverticulum after thorough study and a brief (6 weeks) trial period of observation and treatment

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BOOK REVIEWS

The Medical Annual A Year Book of Treatment and Practitioners Index by 42 contributors Edited by Sir *Henry Tidy* K B E M A M D (Oxon) F R C P and *A Rendle Short* M D B S B Sc F R C S 70th year 444 pages illustrated J B Lippincott Co Philadelphia Pa publishers 1952

Although most current reviews restrict their discussion to one specialty, this volume covers all fields, including roentgenology and psychiatry All the authors except Middleton are from Great Britain The newer trends in each field of medicine are

adequately reviewed The authors have selected only the most pertinent material The citrovorum is included in the discussion of megaloblastic anemias The volume has a number of excellent tables and illustrations There are about 50 color plates This book is strongly recommended for general practitioners and service personnel in smaller institutions

—*Col F W Pruitt MC USA*

Advan I t m l M di ne d ted by *W ll m D k* M D L g *I* land Coll g f M d B ookly d *I Snapp* M D Th M u t S H p tal N w Y k N Y V l me V 464 p g ll trat d Th Y ar B k P blish In Ch c g Ill p blish 1952

This volume contains an up-to date review and appraisal of 9 subjects by recognized authorities The presentations are concise well organized easily read and adequate The subjects and authors are as follows (1) Diseases of the Pregnant Woman Affecting the Offspring by Bass (2) Catheterization of the Heart by Bing (3) Portal Hypertension and Its Treatment by Blakemore (4) The Anemia of Infection" by Cartwright and Wintrobe (5) Gout by Gutman and Yü (6) Clinical Aspects of Ganglionic and Adrenergic Blocking Agents by Lyons and Love (7) Aspects of the Influenza Problem" by Mulden (8) "Experience With Adrenocorticotropic Hormone (ACTH) and Cortisone by Ragan and (9) Abnormal Proteins in Myeloma" by Strom

Bing s discussion on cardiac catheterization is especially noteworthy It covers the technic interpretation indications limitations hazards and complications of the procedure In addition clear diagrammatic interpretations of catheterization findings in various cardiac abnormalities are included Gutman and Yü describe the present concepts of the derangement of purine metabolism in gout and modern approaches to therapy Although containing nothing new this is a good review Ragan s experiences with ACTH and cortisone will be most helpful in orienting the clinician as to the place of these agents in modern therapy Of particular importance are the limitations and com plications of this type of therapy Lyons and Love remove a great deal of confusion from the present controversial subject of ganglionic and adrenergic blocking agents This discussion should be read by all who use these drugs

—*Commander J B MacGregor MC USN*

MANAGEMENT OF ACUTE HEAD INJURY[1]

JULIAN A JARMAN *Colonel USAF (MC)* [2]

THE correct management of acute head injury has been one of the most difficult problems facing physicians since ancient times In Hippocratic writings [3], head injuries are described in detail and the use of the trepan was limited as it is today Doctors would gladly turn over patients with this injury to a specialist but because there are not enough neuro surgeons to take care of all such patients, all physicians should be able to administer proper emergency care and recognize com plications when they arise

Clinical research in recent years has greatly contributed to our knowledge of the pathophysiology of this condition, and this understanding has placed an even greater responsibility on the average physician Many believed that disruption of the nor mal continuity of the skull was of paramount importance, but we now know this is not true and that irreparable damage can take place without a single break in the bony framework of the skull Denny Brown and Russell [4] have shown that brain damage may result from "compression concussion" and "acceleration con cussion " Compression concussion occurs when the skull is sub jected to trauma and is momentarily deformed and distorted though not fractured This distortion impinges on the brain, producing increased pressure in some areas and decreased pres sure in others The rebounding return of the skull to its former shape produces abrupt changes in intracerebral pressure with damage to the leptomeningeal vessels Acceleration concussion, on the other hand, results from the momentum of the brain within the skull as the head is thrown through space and then abruptly brought to rest.

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(1) Pr s nted t a me ting of the Las Vegas County Med cal Society 20 May 1952 at U S Air Force Hosp tal Nell Air For e Ba e Nev

(2) 5005th U S Air Force Med cal Group

(3) Adams F Injur s of the Head The Genuine Works of Hippocrat s Vol I C & J Adelard London 1849 pp 421 466

(4) Denny-Brow D nd Russ ll W R Experimental cer bral concussion Brain 64 93 164 Sept 1941 Absu Proc Roy Soc Med 34 691-692 Sept 1941

Pudenz and Shelden *(5)* have shown in ingenious experiments on monkeys with lucite skulls that blows to the head produce rotating swirling movements of the convolutions of the brain These convolutional patterns vary with the direction of the displacement of the head Their experiments indicate that the frontal lobes of the brain are relatively fixed by the anterior fossa and less movement occurs there than in the parietal and occipital lobes A similar situation exists in the temporal lobes which are fixed in the middle fossa of the skull This fixation of the frontal and temporal lobe subjects them to greater shearing forces and results in local laceration of cerebral tissue and blood vessels These observations explain the contrecoup injuries more logically than previous theories and the experiments are especially convincing because they are documented by high speed cinematography through a lucite calvarium

Cerebral edema was considered for many years to be a frequent direct cause of death and attempts were made to prevent and control this condition by limiting fluid intake and administering various hypertonic solutions intravenously Extracellular accumulations of fluid occur but usually as a late manifestation in cerebral swelling that is preceded by intracellular hydration hemostasis anoxemia and endothelial damage Scheinker *(6)* emphasized the term cerebral swelling " instead of cerebral edema " believing that the swelling was due to vasoparalysis as Friedman first suggested Forbes and Wolff *(7)* demonstrated that there is a definite cerebral vasomotor control center The increased volume of the brain is important because it may cause herniation of the uncus of the temporal lobes through the tentorium resulting in pressure on the hypothalamus Kahn *(8)* has shown experimentally the disparity between intraventricular and cisternal pressure in waterlogged animals intraventricular pressure was always elevated but cisternal pressure seldom and that decreasing intraventricular pressure improved respiration and circulation but lowering cisternal pressure further embarrassed these vital functions This observation is important in view of the fact that many physicians have treated brain injuries by repeated spinal puncture

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(5) Pud nz R H nd Sheld C. H Luc calva um—a me hod for d t ob va on f b ra al tra ma nd brain m me J Neurosurg 3 487-505 N 1946

(6) Sch k L M. Neurosurg cal P h l gy Cha le C Th ma Publishe Spring fie Ill 1948

(7) Forbe H S nd W lff H G Cerebral r ula va motor contr l of bral ve ls Ar h Neur l & P ychia 19 1057-1086, June 1928.

(8) Kah A J Eff t f va a ns tra ra al pr ur Ar h N urol & P y hiat 51 508-527 June 1944 or 52 71 July 1944

DeGutierrez Mahoney and Robinson *(9)* recently reported work done 10 years ago to increase the understanding of the patho genesis of traumatic unconsciousness By studying gross sections of untraumatized portions of brains of 4 persons who died from 12 to 48 hours after injurv and those of dogs, they found that a physical change takes place in brains that have been trau matized even slightly though no gross lesion is present These changes included a disturbance of the cell body, the axis cylin der, and the myelin, as well as demyelination with associated perivascular deposits of fat Unconsciousness resulting from head injury could be attributed to diffuse physical and functional loss of a certain percent of the total nervous elements, and this is the fundamental pathologic explanation of unconsciousness

PRINCIPLES OF TREATMENT

Although it is illogical to believe that an adequate set of rules can be developed which will permit a physician to care for all severe head injuries easily and properly, an acceptable system of care will reduce this task

Bed rest The patient should be brought directly to the treat- ment ward and put to bed, preferably on his side in mild Trendel enburg position under the constant observation of properly in structed attendants Inflexible routine treatment of patients suffering from severe head injury is not only useless but dan gerous No other surgical patients require such individual con sideration Alert, watchful care is perhaps the most important feature Because the patient s condition may vary from hour to hour, continuous, efficient and intelligent nursing care is nec essary

X ray The importance of a roentgenogram of the skull in the early hours of treatment is questionable but I believe that it should be mentioned as it is one of the things frequently con- sidered when the patient is first seen Its greatest value probably lies in the demonstration of a depressed fracture, or of a frac ture line across the course of the middle meningeal artery These conditions can usually be diagnosed clinically If the patient s condition permits, roentgenograms should be made early They are of secondary importance and should be omitted if the ex tra manipulation might have a deleterious effect on the patient

Tracheotomy It is essential to maintain an adequate airway in these patients Many patients with head injuries probably

(9) DeGut r z Mah ney C G and Robinson, F Acute c tocc bral injurie cl ical nd perimental tudy of re lts of more ffective form f tr atment S Clin North Amer ca 471 489 Apr 1952

die from obstruction of the air passages due either to inability of air to get into the lungs or to retained secretions Anoxemia is one of the primary causes of waterlogged brains Recently, a patient with a severe head injury was brought into our emergency room A tracheotomy was performed without anesthesia and it was astounding to see the immediate change in his condition He lived 3 days after tracheotomy but without it would have died much sooner

Tracheotomy was rarely performed for this condition a few years ago but I believe it is now practiced fairly consistently Patients with head injury develop excessive pulmonary secretions which can be evacuated readily through a tracheotomy tube Once an adequate airway has been established oxygen should be administered to every unconscious patient The secretions may be so tenacious that the force of gravity and catheter suction are insufficient to remove them We are very fortunate in having a piece of equipment mist-O_2 gen by which a desired concentration of oxygen more than 60 percent if indicated with a high degree of humidity is delivered to the patient in an open top tent both oxygen and an agent to liquefy secretions in the bronchial tree are thereby furnished concurrently *(10)* Antibiotics can be delivered to the lower respiratory tract in the aerosol from this device For general use a tent is considered preferable but a nasal catheter is adequate No matter which is used proper humidity should be emphasized because dry oxygen will increase the tenacity of the mucous secretions and lead to fatal atelectasis

Shock Symptoms of traumatic shock are infrequently observed in patients with uncomplicated head injuries If the patient is in shock one should be careful in seeking other injuries such as a broken neck a fractured femur or a ruptured viscus Hemorrhagic shock may occur from extensive lacerations of the scalp which have not received early treatment We routinely introduce a retention catheter early in treatment On evacuation of the urine evidence of injury to the genitourinary tract may be apparent Visual evidence of kidney function is a valuable aid in the treatment of shock Continuous catheterization assists in maintaining water balance and frequently obviates a change in bedclothes

Adequate history and physical examination are more important in institutional care where one doctor might admit a patient in the evening and another take care of him the next day The history

(10) De R Kelle L A Hoffma A A nd J ma J A T tme f p l m mary mpl nd y ppe pura ory f t ns U S Armed For M J 4 643-652 May 1953

might not be available from the patient himself, but probably could be obtained from whoever picked him up or witnessed the accident The state of consciousness and the observation of a lucid interval are diagnostically important as they are usually present in patients with expanding lesions A history of vomiting is important because many of these patients, if they vomit and are unattended, may aspirate this material and develop pulmonary complications A record of spinal fluid leakage is important in planning adequate antibiotic therapy

A complete physical and neurologic examination should be made as soon after admission as possible as it provides a base line by which to evaluate deviations An appraisal of the conscious level is important in prognosis and treatment. Frequent checks should be made of the conscious level because it is probably the most accurate index of progress Blood pressure, pulse, and respiratory rates should be observed and recorded early The size, reaction, and quality of the pupils should be recorded in all patients suffering from acute head trauma, pupillary function is second in importance only to the state of consciousness Segerberg and Spurling *(11)* stated that it should be assumed that every patient with a unilateral dilated fixed pupil has an extradural clot until proved otherwise Operation in such circumstances is lifesaving and procrastination may mean death Ophthalmoscopic examination may reveal progressive choking of the optic disk, indicative of increased intracranial pressure A choked disk may require several days to develop, but venous engorgement, retinal hemorrhage, blurring of the disk margins, and obliteration of the normal landmarks of the disk are valuable signs in determining the degree of intracranial tension

Localizing signs such as motor power of the extremities, may be judged in one of several ways If the patient is confused and restless, one may observe directly the manner in which the extremities are used If he is semicomatous, deep supra-orbital pressure will elicit a defense reaction of one or both arms so that their strength may be judged Additional information can be gained by observing the tonicity of the muscles to passive flexion and extension Frequently a bilateral or unilateral Babinski's sign follows severe head trauma but, unless paralysis is present, this pathologic reflex usually disappears as cerebral function improves

Lumbar puncture in patients with acute head injury has been greatly overemphasized Swelling of the cerebral hemispheres

(11) Segerberg L. H., and Spurling R. G. Symposium on recent advances in surgery of cerebral trauma S. Clin. North America 29 1301 1315, Oct. 1949

due to venostasis and cellular edema produces ideal physical conditions for herniation of the temporal uncus into the incisura of the tentorium Sudden release of the infratentorial pressure by lumbar puncture aggravates the unnatural pressure relation ship and must be considered a potential hazard in precipitating or aggravating tentorial herniations In the restless patient pres sure readings are inaccurate and the presence of blood in the spinal fluid is of insufficient diagnostic importance Information that may be obtained from a lumbar puncture can be derived in most instances from other clinical findings

Restlessness is often more disturbing to attendants than to the patient and may be more overtreated than any other symptom It is frequently due to anoxemia which may be controlled in many instances by proper oxygenation Restraints should never be used Some restlessness is beneficial as it permits changes in motor function of the extremities to be observed Morphine should not be used because it depresses respiration and masks ocular signs If sedation is necessary small doses of paralde hyde are recommended

The hypothalamic centers are particularly susceptible to trauma and the heat regulating mechanism is frequently upset When the rectal temperature reaches 104 F every effort should be made to reduce it Sometimes simple measures such as cold water or alcohol sponge baths will suffice but frequently it will require cold packs with an electric fan blowing on the packs

Fluid balance An accurate intake and output record of fluids must be maintained and any blood lost should be replaced with out delay The maintenance of a normal fluid intake is essen tial and the dehydration treatment popular a decade ago has been abandoned The concept that dehydration might prevent cerebral edema is erroneous because this condition probably does not depend on the normal fluid requirements of the body Dehydrating agents are seldom recommended as there is no clinical evidence of their value The average adult should receive from 2 500 to 3 000 cc of fluid in 24 hours to maintain a normal state of hydration and we furnish this as 5 percent dextrose solu tion In the second 24 hour period fluids equal to the insensibl loss plus the urinary output should be given but with no mor than 500 cc of saline solution Thereafter fluids, calories an vitamin requirements can best be administered by gavage W maintained a patient on this regimen for 57 days Even thoug he never attained normal mentality he recovered sufficiently t take care of himself We use a gavage solution of about 1 00 calories per 1 000 cc that is high in proteins carbohydrates and vitamins

Other measures of importance are protection of the eyes, care of the mouth, antibiotic therapy, and the prevention of hypostatic pneumonia Fecal impaction should be prevented

Except for the care of certain obvious conditions such as lac erations of the scalp, compound fractures of the skull, and de pressed fractures of the skull, most patients with severe head injuries recover without surgical operation Although in 700 con secutive patients with head injuries, DeGutierrez Mahonev and Robinson *(9)* reported surgical intervention in onlv 58 (8 percent), this represented 50 4 percent of those classified as "severe" head injuries Elective operations should be performed as soon as the patient s condition permits Compound fractures and de pressed fractures fall in the "urgent" category, but the patient should not be hurried to the operating room at the expense of prop er preparation Débridement should be accomplished in compound fractures, from without in, and should be thorough The dura should be closed, if possible, or the gap should be bridged with fascia lata to prevent scarring Replacement of bone fragments is not advocated The fascia and skin may be closed initially and the defect later bridged over with bone or tantalum

Depressed fractures are usually associated with localized cerebral laceration and contusion and if uncorrected, may be a cause of traumatic epilepsy Extradural and subdural hemorrhage produce the same signs and symptoms, except that the former usually occur faster

Segerberg and Spurling believed that, of all serious complica tions of head trauma extradural hemorrhage is the easiest to recognize and the most satisfactory to treat yet it is reported that in most large clinics the mortality from this lesion varies from 30 to 50 percent This may be due to failure in diagnosis, delay in operation once the lesion is suspected or severe as sociated injuries The findings are usuallv classical The pa tient is dazed or unconscious for a few minutes after a blow on the head He may recover completely or may complain of head ache, perhaps nausea, or a feeling of faintness He usually becomes rational after the injury (lucid interval) Within an hour or so he becomes dull and feels drowsy sleep steadily pro-gresses to coma with stertorous breathing the pulse becomes slow and the blood pressure is elevated There are usuallv signs of external violence over the head in the temporal region— the pupil on the injured side may be larger than on the normal side or may even be widely dilated and fixed There may be con tralateral weakness of the arm and leg with a positive Babinski's sign on the weak side If there are roentgenograms of the skull,

a fracture line may be seen across the course of the middle meningeal groove Although some patients may not regain consciousness in others the lucid interval may last several days Early diagnosis cannot be expected until all physicians—even those who care for patients with head trauma only occasionally—know these early signs and symptoms Because it is impractical to hospitalize every patient in civil life and because it is even impossible in many instances to have a private nurse or professional attendant constantly with the patient an intelligent member of the family should be selected to stay with him and be thoroughly instructed as to what to look for Segerberg and Spurling go so far as to say that no patient who has been unconscious from a head injury should be allowed to sleep longer than 2 hours during the first night without being aroused

Subdural hematomas may be acute or chronic Intracerebral hematoma may be discussed at the same time as acute subdural hematoma because pathologically they may arise in the same way The patient with an acute subdural hematoma usually comes to the hospital still in coma When contrecoup injuries occur, they are usually of this nature When intracerebral bleeding occurs the hemorrhage may consist of large amounts of laked or clotted blood It may be impossible to differentiate between extradural acute subdural and intracerebral bleeding This differentiation is of academic interest only All 3 lesions demand prompt surgical exploration

Chronic subdural hematoma has an insidious onset The injury may be slight without rupture of brain tissue Shearing of a small vein bridging the cerebral cortex and sagittal sinus is sufficient A small amount of bleeding that becomes walled off is augmented by the dialysis of cerebrospinal fluid into the area through the semipermeable arachnoid membrane so that the protein content in the hematoma is greater than that in the cerebrospinal fluid The expanding subdural hematoma is progressively encapsulated by a membrane of mesothelial cells The symptoms may not be distinguishable from those of a brain tumor because the injury may have been slight and overlooked The major complaints are increased headaches and mental dullness progressing to somnolence Convulsions or hemiparesis may develop There is usually papilledema slowing of the pulse rate and gradual increase in systolic blood pressure Spinal fluid may be xanthochromic When subdural hematoma is suspected, bilateral burr holes should be placed in the superior temporal frontal and parietal regions A blue discoloration of the dura is a characteristic finding Frequently the lesion can be cured by simple evacuation of the hematoma with thorough lavage of the interior of the limiting membrane Occasionally it will be filled with solid clots and a more extensive unroofing may be necessary for this evacuation

Subdural hygroma closely simulates subdural hematoma It is caused by a tear in the piarachnoid which acts as a ball valve allowing cerebrospinal fluid to escape but not permitting it to return Symptoms and treatment are similar to those described for subdural hematoma

Persistent *cerebrospinal rhinorhea* sometimes requires surgical operation It is caused by dural laceration accompanying a fracture through the anterior fossa into the cribriform plates, and is usually unilateral This condition usually clears spontaneously, but if it persists, consideration should be given to operation by a neurosurgeon

Tentorial herniation with the development of decerebrate rigidity arises as the result of a massive cerebral lesion producing herniation of the brain stem This condition may occur whenever the intracranial tension above the tentorium is greater than below, particularly when the increase of pressure is rapid Extradural hematoma subdural hematoma intracerebral hemorrhage and cerebral edema are frequently complicated by tentorial herniation Whatever its cause may be, it is a serious complication for which effective treatment has not been fully established Many methods of treatment have been described, but one developed by Boctterell and reported by Segerberg and Spurling appears the most logical This method consists of removing the pulpified brain in the temporal or frontal area with suction producing an internal decompression They believed that removal of this useless pulpified brain tissue discourages cerebral swelling The surgical approach is on the inferior and medial surface of the temporal lobe, which reduces the danger of sacrificing centers of vital cortical function This is a logical approach for it permits the removal of damaged brain tissue and intracerebral clots and assures control of the bleeding vessels in the area As the temporal lobe is most frequently involved, the approach is first directed towards this area This is major brain surgery

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BOOK REVIEW

The Human Senses by *Frank A Geldard*, Professor of Psychology University of Virginia 365 pages Illustrated John Wiley & Sons Inc New York N Y publishers 1953 Price $5

In many ways this is a remarkable book In the preface the author makes a somewhat apologetic gesture to the possible prejudices of his professional colleagues for introducing a book on the human senses in this day of emphasis on the "science of

behavior " Fortunately thereafter he writes without apology and with complete fidelity to the fundamental role of the senses in regulating behavior and supplying our knowledge of the world about us The many who will read this book will be convinced no apology is required On the contrary they will be grateful for one of the most useful and readable books on the senses which has been written The author s grasp of his subject permits him to move about among complex data and theories of the senses with ease and clear insight and to give the reader a clear comprehen sion of a subject which too often in the past has been buried in a mass of handbook data

A short introductory chapter places the study of the senses in its historical framework and relates the importance of the understanding of the senses to the new field of human engineering Geldard s wartime experience as chief of the Psychological Section of the Army Air Force Training Command and his present position as chairman of the Human Resources Committee of the Research and Development Board Office of the Secretary of Defense gives him an excellent background from which to survey the relationship of the senses to human engineering For each sense described in the book there is a systematic description of the known facts and theories Each sense is explored system atically in relation to stimuli and anatomic physiologic and psychologic functions and theory The accompanying charts diagrams, and illustrations enhance the value of the text The author maintains an admirable scientific caution which in no way limits his subject matter but on the contrary, permits him to evaluate critically and to suggest areas where further knowledge and research are essential to a complete understanding of the subject Vision audition the cutaneous senses pressure pain temperature kinesthetic and organic sensibilities labyrinthine sensibility, smell and taste are described An extensive list of references and an index are included The phenomenologic and psychologic characteristics of sensitivity are integrated into the body of knowledge of each sense by a careful selection of experimentally demonstrated facts To be able to cover such an extensive area as the senses in 365 pages avoiding either paucity of details or incompleteness of exposition is an accomplishment I wish were more generally extended to writing in other fields

The book may be read with understanding by anyone interested in the senses who has a basic familiarity with physiology psychology or experimental methodology Used either as a textbook or as supplementary reading and probably also as the basis for the instructor s lectures it will be a boon to instructors in psychology and physiology It is recommended to all who wish a readable accurate and up to-date account of the status of our knowledge of the senses —*Col J Buel USAF (MSC)*

PREVENTIVE PSYCHIATRY IN THE COMBAT ZONE[1]

ALBERT J GLASS *Colonel MC USA (2)*

TO conserve the fighting strength is the traditional obligation of the Army Medical Service Although in past wars and in the Korean conflict, Army medical personnel have made great strides toward this objective, progress in the preventive aspects of field medicine has been limited, to a great extent, to the purely organic sphere of disease and injury Relatively little consideration has been given to the fact that human effectiveness in combat is largely determined by an interaction of both somatic and psychic forces Such a psychosomatic approach to the problem of individual combat efficiency is especially needed as the increasing destructiveness of modern war imposes ever greater physical and mental hardships on its participants It is the object of this report to describe the mechanisms involved in the total reaction of soldiers during combat in an effort to indicate additional ways of implementing more completely the mission of the Army Medical Service

MANIFESTATIONS OF FAILURE

The following manifestations of failure in combat delineate the magnitude and scope of the problem *First* there are the numerous nonbattle casualties Their frequency exceeds the battle casualty rate in increasing proportions the longer a unit remains engaged with the enemy Over 50 percent of nonbattle casualties involve persons with (1) slight organic disease or injury that is only mildly, if at all, incapacitating (2) subjective complaints and negative or inconsequential physical findings (3) self inflicted wounds and injuries that are due to carelessness, (4) broken or lost spectacles and dentures and (5) psychiatric conditions Although many of these patients can be returned to duty by prompt medical management and treatment their services are lost for a long or short time and in many persons, the original cause for evacuation will continue to operate after they are returned to duty

Second there are the combat failures as manifested by disciplinary offenders Of special importance in this group are the

(1) Pr t d t th Sympos m on Str ss 17 March 1953 t th W lter R ed Army M d c l C t W h gton D. C.

(2) Brooke Army Ho pital Fort Sam Ho ston Tex

purely military crimes directly connected with the battle situation such as insubordination disobedience of a direct order misbehavior before the enemy, desertion and AWOL In these offenders the overt withdrawal from battle is plainly a psychologic failure of adjustment which, in World War II caused a serious loss of manpower

Third and perhaps most important from a numerical standpoint there are the men who remain in combat but contribute little or no fire power This phenomenon has been noted by many observers of front line fighting and has been thoroughly studied by Marshall *(3)* who stated that only from 15 to 25 percent of rifle company personnel actually fire on the enemy and exhibit aggressive activity on appropriate occasions Although this may be a low estimate for fire-power participation in the Korean campaign no one can deny that the large number of such passive combat *personnel constitutes a serious problem*

Common to all of these manifestations of combat failure is an apparent inability of the soldier to assume or to continue an aggressive role against the enemy This defect does not come as a direct result of enemy action such as an incapacitating wound nor does it arise from unavoidable battlefield conditions that may produce a disabling injury, such as frostbite or a disease such as infectious hepatitis Rather, it stems from forces within the man that seemingly bind or restrict the function for which he has been trained and equipped The ubiquitous phenomenon of *battle fear* is responsible for producing this inhibition of aggressive action The crippling sensations of battle fear are well known and are experienced by almost all combat soldiers Indeed it has always been considered good military strategy to weaken enemy resistance by intensifying or otherwise using the sounds and other stimuli which provoke fear In brief, the paralyzing property of battle-induced fear is the common denominator in the cause of all forms of combat failure

Time does not permit an adequate discussion of the origin and mechanism of fear, which is a basic biologic factor that warns a person of impending danger The greater the extent to which a *man believes that his existence or the values held essential* for existence are threatened, the more intense is the crippling feeling of fear In battle fear varies in direct proportion to the real or imagined danger from the enemy It is usually judged by the intensity of enemy fire power particularly when the effect of that fire power is confirmed by the presence of nearby casualties Thus the incidence of psychiatric casualties the most direct manifestations of combat fear regularly rises and falls with the battle casualty rate The influence of fear is more indirect in

(3) Marshall S. L. A. Men Against Fire William Morrow & Co New York N Y 1947

noncombat casualties, yet their frequency also increases with the length of time a unit remains in battle The most striking effect of fear, as reported by Colonel Marshall, is the failure of riflemen to fire their weapons in battle, although no such inhibition is present on maneuvers or on other occasions when battle fear is absent

In its effect on combat personnel, fear can be compared to the action of a virus or other infectious agent If the dose is sufficiently large, almost anyone may be overwhelmed Similarly, when smaller doses of fear are administered steadily over a prolonged period of combat, even the superior soldier will slowly but surely become ineffective Like infectious agents, fear may be contagious, but it spreads far more rapidly than they because there is little or no incubation period Unlike infectious organisms, however, fear does not confer an immunity on its victims Men may learn to adapt better under fearful conditions, but there is no diminution of the painful and paralyzing action of fear as a result of repeated exposure This fact is responsible for the recognition of rotation as the only method of preventing the inevitable breakdown of veteran combat personnel

Despite the devastating effect of battle fear, many combat participants not only function effectively, but often perform feats of bravery involving extraordinary aggressive behavior Moreover, the influence of fear in battle is uneven Its effect varies even in the same man The personnel of some units may consistently perform more effectively in battle than that of other units despite similar stressful conditions It is clear that there are successful defenses against fear Although our understanding of these protective mechanisms is far from complete, we have some knowledge of the complex process that is involved

ANTIDOTES FOR FEAR

Activity At the outset, it can be stated that there is an antidote to the poison of fear, namely, co-ordinated external activity In combat, even speech is beneficial, but aggressive action, as in firing and purposeful movement produces marked relief from the sickening feelings of fear and allows the soldier to think logically again and to make rational decisions The reasons for this alleviation of fear illustrate well the psychosomatic basis for human behavior Fear produces both a psychologic and physiologic effect on a person in order to prepare him for fight or flight The same tension that grips and paralyzes the mind also presses the bodily mechanisms for action Action, therefore, drains tension, whereas inaction fosters the damming back and building up of tension This state of affairs is exemplified by the many occasions in combat when external activity is impractical or impossible The increased painful tension produced by such an

purely military crimes directly connected with the battle situation such as insubordination disobedience of a direct order misbehavior before the enemy desertion and AWOL In these offenders the overt withdrawal from battle is plainly a psychologic failure of adjustment which in World War II caused a serious loss of manpower

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(3) Marshall S. L. A. Men Against Fire. William Morrow & Co. New York N Y 1947

of withdrawal from combat. Conscience functions as an internal policeman It may not force the soldier to fire his weapon, but it does curtail his tendencies to flee the painful battle situation This self governing faculty can be used as a basis for further influencing the soldier toward aggressive action as being the only correct behavior in battle that will be rewarded by a feeling of self esteem

Self love A third personality trait pertinent to combat adjustment is the universal characteristic of self love, termed narcissism by psychiatrists It is, perhaps, better understood as the self or egocentric component of the person Varying degrees of this trait determine the extent to which a man can love or be concerned for persons other than himself Usual quantities of self love do not prevent devotion to family and friends, and lesser feelings for more remote society groups such as the state and nation, but it is rare to find persons comparable to the historic Nathan Hale who regretted that he only had one life to give for his country In combat, men dominated solely by self love are much more affected by fear, because their entire interest is in the self, whereas the average soldier is able to transform some quantity of fear into concern for the safety and welfare of his buddies

It is hoped that the foregoing discussion of personality traits does not give the impression that they play only a fixed role in combat adjustment Such an impression would warrant the conclusion that only by the selection and removal of vulnerable personnel could combat failure be prevented Nothing is further from a practical solution of the problem *First*, there are no available methods that can correctly estimate the degree and strength of the various personality constituents *Second*, the many imponderables in battle make any estimation of personality structure of doubtful value Truly the battle is the payoff when men may perform feats of endurance and bravery that neither they nor others could predict. It is only when marked passivity *and/or* self love are present in a man that change to a more effective combat adjustment is difficult or impossible

Physiologic well-being Attention can now be directed *toward* the less structured elements of combat adjustment The physiologic status of persons who struggle against combat fear is very important Weakness in the physical sphere automatically diminishes ability to perform the necessary actions required for aggression A man with decreased physical power is temporarily like the severely passive soldier *who* can only absorb fear, because of inability to be aggressive It has been repeatedly observed that undue fatigue and deprivation of food, sleep, and water may readily produce ineffective combat performance For

this reason combat units must be placed in reserve at periodic intervals for rest and recuperation Intercurrent illness such as diarrhea, malaria and hepatitis, aggravated by the usual discomforts of men in battle produces a breakdown in the defense against fear In Korea during the summer and early fall of 1950 patients with Japanese encephalitis were evacuated as having combat exhaustion because their initial symptoms indicated disabling fear The necessity of maintaining the physical well being of combat troops is well known but the fact that smaller or less apparent bodily weakness may upset the psychic control of fear is not so well recognized For this reason alone and exclusive of morale purposes combat effectiveness can be enhanced by attention to diet or to other measures that maintain physical status

Training A realistic training program increases physical stamina and prepares the soldier to endure the hardships of combat but even more important, training provides the technical information and practice in the use of weapons that make possible aggressive behavior Instruction in combat tactics facilitates a better awareness of danger and the protective measures that are best employed Despite these advantages troops new to battle have an increased number of all types of combat failure This is especially true of replacements that are suddenly ordered into active combat In part at least this defect of new troops lies in (1) their inability to acquire rapidly the aggressive patterns of behavior and (2) their overevaluation of battle stimuli because of inexperience As a preventive measure a battle indoctrination period of from 7 to 14 days has been instituted for all infantry divisions in Korea Any method that allows the replacement to become acquainted with the members of his combat group enlarge his knowledge of enemy tactics, and become familiar with his weapons will surely diminish the first impact of battle and aid in building defenses against fear

Group identification The most important component in the psychosomatic defense against battle fear is the powerful support that can be obtained from the group or combat unit This sustaining force called group identification or group unity refers to the emotional bond that develops among men who share common hardships and danger It has been repeatedly demonstrated that positive group unity is the distinguishing characteristic of successful combat units who endure severe battle losses with a minimum of individual combat failures The intricate process by which such successful groups operate is as yet not completely understood

Seemingly group identification spontaneously arises as a defensive measure by two or more persons in response to a com

mon menace Nowhere is there a greater need for such an alliance as in battle, for, as well stated by Marshall, "The battlefield is the lonesomest place where men may share together" In this situation, men move toward each other both figuratively and literally for protection and emotional warmth. When group unity proves by battle test to have value, strong friendships are rapidly formed and intensified by the mutual exchange of affection and protection

This intense emotional relationship, forged in the crucible of combat, exerts a profound influence on character and behavior *First* there tends to be displacement of quantities of self love by concern for the welfare of other members of the group Less fear is then felt for the self, and the consequent decrease of inhibition facilitates aggressive behavior that can be used in behalf of others Such a mechanism accounts for heroic deeds in battle by men who seem heedless of personal danger because they are intent only on securing the safety of their friends *Second* this attitude toward others is re-enforced by a strengthening of conscience that includes the ideals and standards as set forth by the combat group A man who is compelled to abandon selfish desires, "or else," not only suffers self condemnation but risks losing the actual and emotional support of the group Even the poorly motivated soldier is literally forced to adopt the prevailing group attitude because the battle situation is hardly a place to be left alone *Third* there is the effect of the group on the character trait of passivity As the passive soldier comes to feel more secure by identification with a strong group, he adopts their aggressive attitude It is sometimes amusing to note the recent replacement to a veteran unit who not only talks and acts like the others, but assumes the entire history of their vicissitudes and grievances Even the severely passive person can become effective if bolstered by a strong buddy

The result of favorable group identification for the soldier is lessened vulnerability to battle fear and an increased tendency to aggressive behavior Its benefits are strikingly revealed when group unity is suddenly disrupted or destroyed in battle The survivors stripped of their support and figuratively alone, are suffused with fear and many become temporarily ineffective

Leadership Unfortunately, not all units form favorable identifications or derive the benefits that have been described. Some groups for various reasons, do not develop unity of spirit. Their combat efficiency if any, is solely due to the work of a few aggressive men Such groups are merely a collection of soldiers in a military unit. Other units may have cohesiveness and other characteristics of group identification, but are poorly motivated for the combat mission With this defect in group attitude, members

a staff officer with a major responsibility of advising his commander on all matters that will conserve effective manpower whether it be in the prevention of organic disease, psychologic failure, or combinations of both In such a function the medical officer should not believe that he must be equipped with the technical knowledge of a psychiatric specialist He understands the emotional reactions of combat soldiers far better than most psychiatrists because he is intimately associated with combat personnel and is personally identified with the battle situation Much of the psychologic data required by the field medical officer is available and more will be forthcoming in the future from research projects that are now underway

In order to perform their staff functions battalion and regimental surgeons cannot seclude themselves in their aid stations and play a passive role of waiting for casualties They should visit the various units consult with the company officers and demonstrate interest in all manpower problems When information gained on these visits is combined with data obtained from patients the medical officer, particularly the battalion surgeon is in an excellent position to indicate problems and perhaps, their cause and prevention as well Line officers also should be taught all we know about the prevention of nonbattle casualties including the fact that medical staff officers can supply both information and technical advice

If attention is focused on this aspect of preventive medicine by both medical and line officers benefits in combat efficiency are as inevitable as the advantages that followed attention to prevention of organic disease Both situations involve the vital principle of first recognizing that a problem exists, then of developing the methods of prevention which logically follow and which can be developed further

For the medical officer work in preventive psychiatry can be especially gratifying It will broaden his outlook and make him truly a specialist in conserving the fighting strength He can thereby better keep up with his civilian colleagues who more and more are using a psychosomatic approach to the prevention of failure in civil life

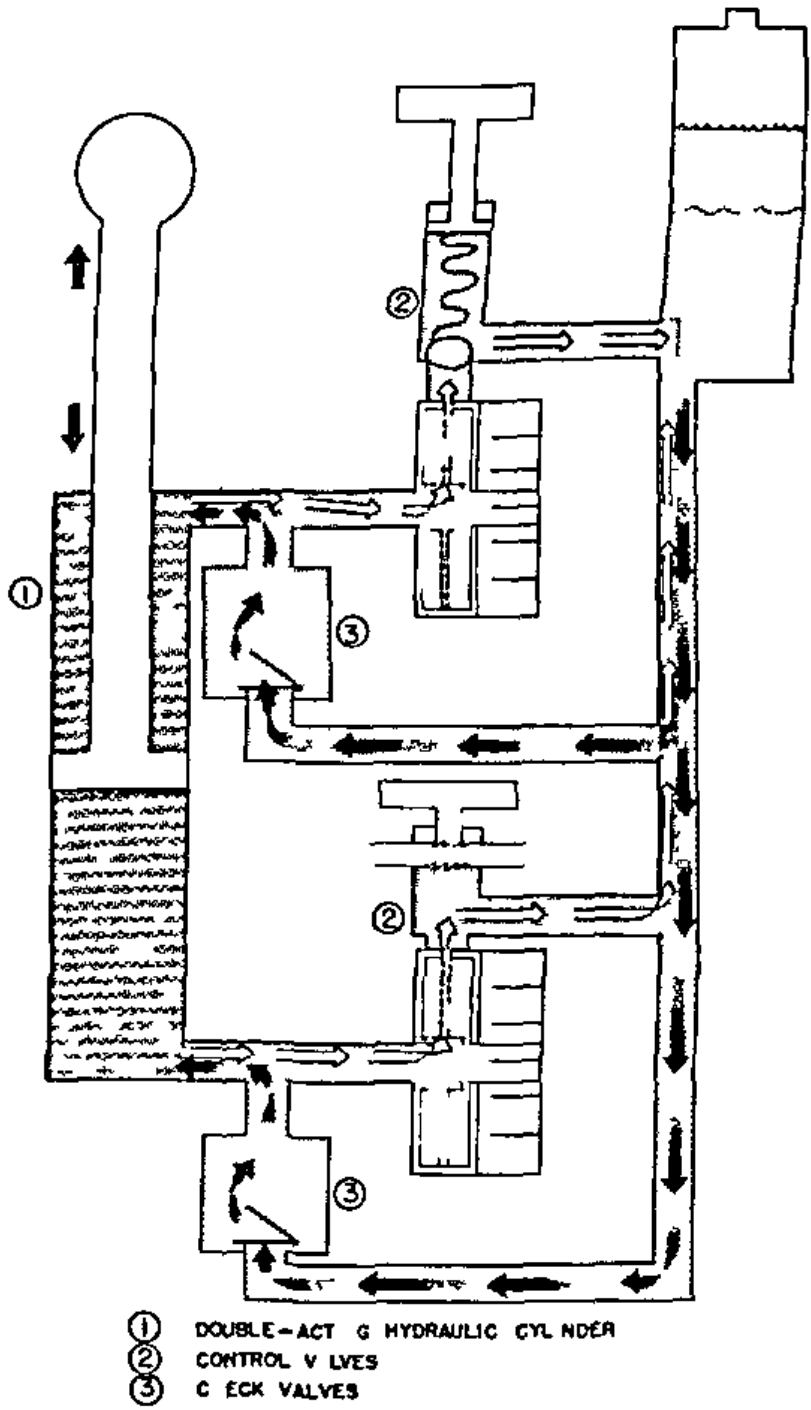
A MUSCLE-CONDITIONING MACHINE[1]

ROBERT W AUGUSTINE *Lieutenant Colonel, USAF (MC)*
LYDIA M KUEHLER *Major USAF (WSC)*
WALTER E LANDMESSER Jr *Captain, USAF (MC)*
MERVEL V PARKER *Captain USAF (MC)*
OTIS L VADEN *Captain, USAF (MC)*

MUSCULAR conditioning is the process of achieving strength and endurance in skeletal musculature The benefits of muscular conditioning include an increase in strength, vigor endurance, and a feeling of general well-being Following injury or operation, recovery of muscle tone by proper conditioning accelerates return of joint motion, enhances circulation to the extremities, and improves the patient s morale Muscular conditioning is achieved by exercise against resistance

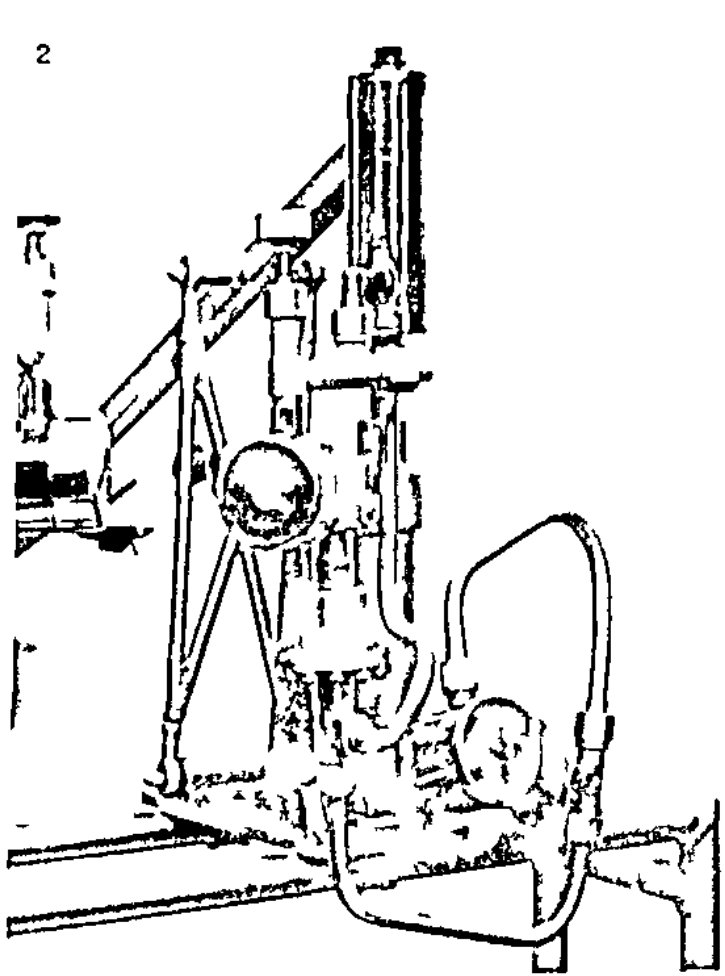
This report describes a resistance machine based on the principle of the variable resistance produced by a hydraulic piston and cylinder Comparative resistances are determined by a gage attached to the fluid flow control valves of the hydraulic cylinder The machine consists basically of 2 hydraulic pistons operated by individual bars attached to fulcrums The addition of a third piston and flexible connections permits movements of abduction and circumduction (figs 1 2 and 3) The distal ends of the bars have footplates for the attachment of shoes or boot casts (fig 4) The hydraulic pistons supply resistance which can be regulated to the capabilities of the patient The machine was designed for, and is used by, patients who have regained neuromuscular control and can resist the force of gravity Prior to the recovery of muscular control and of sufficient strength to resist gravity, the patient is given physical therapy first by simple muscle settings and later in the therapeutic pool When he can resist gravity he is advanced to resistive exercises using the machine herein described Most of our patients progress rapidly to the use of the exercise machine and when they have attained a standard level of performance on it they are adjudged ready for return to duty The pattern of performance on the machine serves as an index of progress and a gage of fitness for duty

(1) U S Air Force Hospital Maxwell Air Force Base Montgomery Ala



F gur 1 Fl id flow diag m of p ton ta ce l m t nd cat g the m thod f cont ll g nd vet g the fl id wh h ppl ta t the cyl nd

The machine is used with the patient lying supine on a table with his legs extending off the end from the mid thigh and with his feet attached to the footplates In operation synchronous flutter kicking of the legs is produced with the knees in a posi tion of full extension This involves musculature from the *nipple*



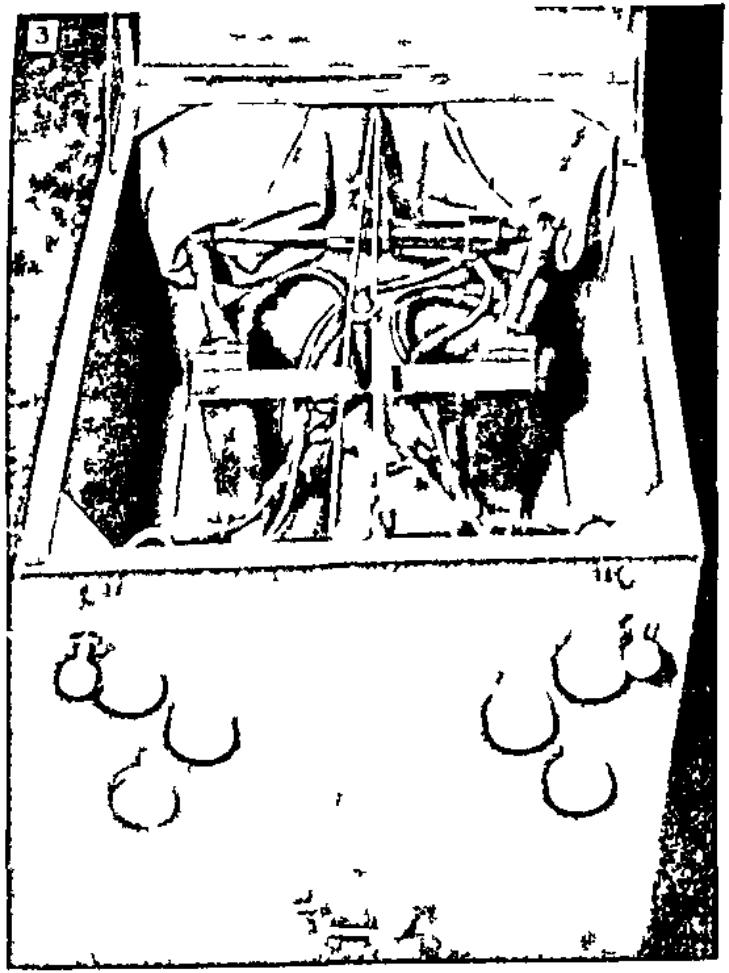


Figure 2 A piston resistance element showing the dials to control variable resistance for the up and down stroke and the action lever attached to the piston Figure 3 Control panel and interior aspect of machine Note horizontal resistance element to permit abduction-adduction motion

line to the toes including the pelvic stabilizing muscles abdominal muscles flexion extension hip musculature the intercostals, diaphragm and the quadriceps femoris The hydraulic units may be used as resistors for the adductors and abductors of the hips as well as for the flexor and extensor muscles Circumduction performed against the multiposition resistance created by the 3 hydraulic pistons co-ordinates the conditioning of the hip and the musculature of the lower extremity The exercise is performed slowly and gently but the effort required soon tires the muscles in use This fatigue is essential for increasing

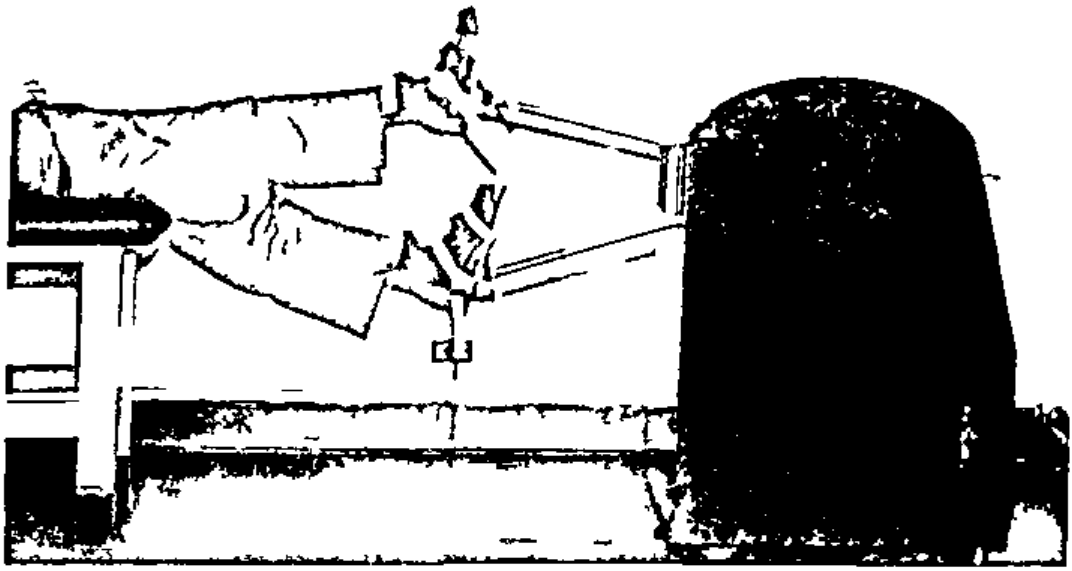


Figure 4 Piston ta c ma h ne i us ex c f lowe i m tie Kn e ar ext nd d and l g a e moved m lta o ly up nd down but oppos t direct ns

muscular strength and endurance In our experience it has never passed the point of rhythmic muscular response and reciprocal action or produced in co-ordination or poor habit patterns of exercise

The apparatus is used for muscular conditioning above the nipple line by replacing the footplates on the ends of the lever arms with handles (fig 5) The patient is placed in a sitting position and grasps the handles to exercise the shoulder joint The arms are kept horizontal to protect the shoulder musculature Abduction adduction flexion extension and circumduction are possible The hydraulic resistance machine has been used for generalized conditioning of specific groups of muscles Large segments of the body may be exercised in one maneuver which develops a synchronous neuromuscular pattern and gradually increases the strength of the weak muscular group until the whole unit is fully conditioned

Conventional conditioning exercises for the lower extremity frequently involve acute flexion of the knee joint and require maximal muscular effort to extend the leg against weights attached to the foot We are opposed to obtaining maximal muscular response from a position of acute flexion of the knee Postoperative or posttraumatic exercise of a joint, such as the knee in a difficult mechanical position such as acute flexion and

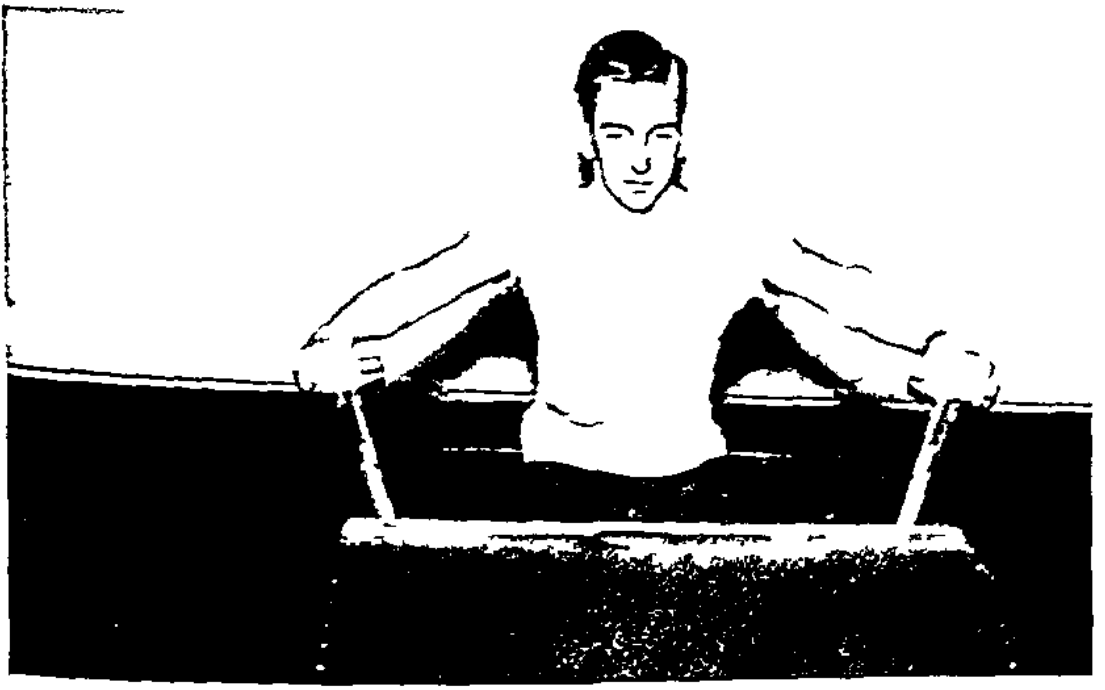


Figure 5 Piston resistance machine showing abduction adduction of both upper extremities synchronous opposite motion and position for protecting the joints

against weights or weighted cables is regarded by us as extremely hazardous We believe that the friction and strain imposed on the subnormal joint is undesirable If a patient is able to perform the physical feats required by such exercises, it is quite likely he is fit for return to duty We believe that with few exceptions, when muscular strength is recovered maximal motion of the involved joint will be obtained We make no attempt to exercise joints, but only to gain maximal muscular strength If this principle is followed joint motion will occur sooner and with greater certainty

Our policy is to exercise the joint in the position of greatest stability protecting it by both flexor and extensor muscle groups Exercises are then directed toward strengthening the surrounding musculature with the joint in this position We believe that recovery of joint motion is the result of favorable physiologic processes rather than of short wave diathermy roentgen therapy When muscular strength is regained, motion in the involved joint usually follows though occasionally manipulation may be helpful

The machine described is not represented as a panacea for motorskeletal disability following injury or operation Our experience has been that it accomplishes muscular conditioning in about 90 percent of our patients The time saved in physical therapy was one factor that induced us to design the machine By means of the valve controls the operator can adjust the resistance of the up and down and side strokes of the pistons for individual requirements The optimal amount of exercise is obtained in 5 minutes or less by resistive exercise This machine is simple to operate and requires little attention during use One physical therapist can supervise a number of machines thus saving time and strength of trained personnel The machine is nearly foolproof and it is almost impossible for the patient to injure himself with it The only servicing required during over 1 year of heavy daily use has been the occasional tightening of several joints to stop minor leaks of hydraulic fluid

The psychologic impetus imparted by the machine is the same as with any given work for which the object is to achieve a high score The physical score is measured as the number of strokes at any given resistance level The psychologic stimulus is less than with competitive sports but when a patient can take part in such games devised for physical exercise he is ordinarily fit for duty

A machine of this type has an application to military personnel other than patients Muscular conditioning is a valuable background for learning neuromuscular responses to new circumstances. The machine described will rapidly and efficiently condition the musculature of the patient and increase his ability to learn new skills

SUMMARY

A machine for muscular conditioning based on the action of variable resistance hydraulic pistons has been designed It is compact easily constructed portable and free of gadgets It is simple to use and has proved effective in achieving muscular strength by active exercise Little effort or supervision is required by the physical therapist The machine has been efficacious in conditioning the skeletal musculature by passive exercise with the joints in a protected position The resistance for each extremity may be individually graded The principle of driving the musculature to fatigue by massive resistive exercise in a short period of time and thereby gaining strength endurance and hypertrophy of skeletal muscles is supported

SIMULTANEOUS RECORDING

of the Electromagnetic Ballistocardiogram and Electrocardiogram on a Single Channel

MONROE H. GREEN M. D. (1)

SINCE the publication by Dock and Taubman (2) of simple ballistocardiographic recording technics, it has become possible for all who have access to electrocardiographs to record ballistocardiograms, using electromagnetic, piezoelectric, or photoelectric pickups, connected with an electrocardiograph of any type. Gubner (3) pointed out that it is necessary to use multichannel recording devices in order to correlate waves of the ballistocardiogram with known events of the cardiac cycle. This was especially important in patients with abnormal tracings. Simultaneous recording of the ballistocardiogram on one channel and phonocardiogram, ECG, or arteriogram on another was required. In the early studies, simultaneous records of all these phenomena were desirable, but at present, with more complete data on the relation of ballistocardiographic waves to circulatory events, this is not necessary for clinical purposes. Simultaneous recording of the ballistocardiogram and ECG, in addition to aiding in identifying component waves of the ballistocardiogram, furnishes important time relationships between the two. The time interval from the onset of the QRS complex of the ECG to the peak of the J wave of the ballistocardiogram is normally 0.25 second. This may be increased to 0.3 in disease states, indicating a lag in both left ventricular ejection and acceleration of the blood flow in the aorta (4).

Simultaneous recording of the ballistocardiogram and ECG in a single channel was accomplished by Gubner (3) by connecting the electrocardiograph to the patient, in any lead, in the usual way and connecting the leads of the ballistocardiograph in parallel with this lead. A rheostat (variable resistance, zero to 1,000,000 ohms) is interposed in series in one of the limb

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(1) Consultant in internal medicine and cardiovascular diseases, U. S. Air Force Hospital, Williams Air Force Base, Ariz.

(2) Dock, W., and Taubman, F., Some technics for recording ballistocardiogram directly from body, Am. J. Med. 7: 7-11, 755, Dec. 1949.

(3) Gubner, R., Selective synchronous recording of ballistocardiogram and electrocardiogram on a single channel, Circulation 4: 237-241, Aug. 1951.

(4) Gubner, R., Rodstein, M., and Lagerquist, H. E., Ballistocardiogram: normal standards and determination of its waves, Proceedings of Twenty-Third Scientific Session, American Heart Association, J. 24: 17-18, p. 24.

leads At zero or low rheostat resistances both ballistocardiogram and ECG are inscribed. The peak of the R wave of the ECG occurs just before, or with the H wave of the ballistocardiogram the peak of the J wave occurs within 0 25 second

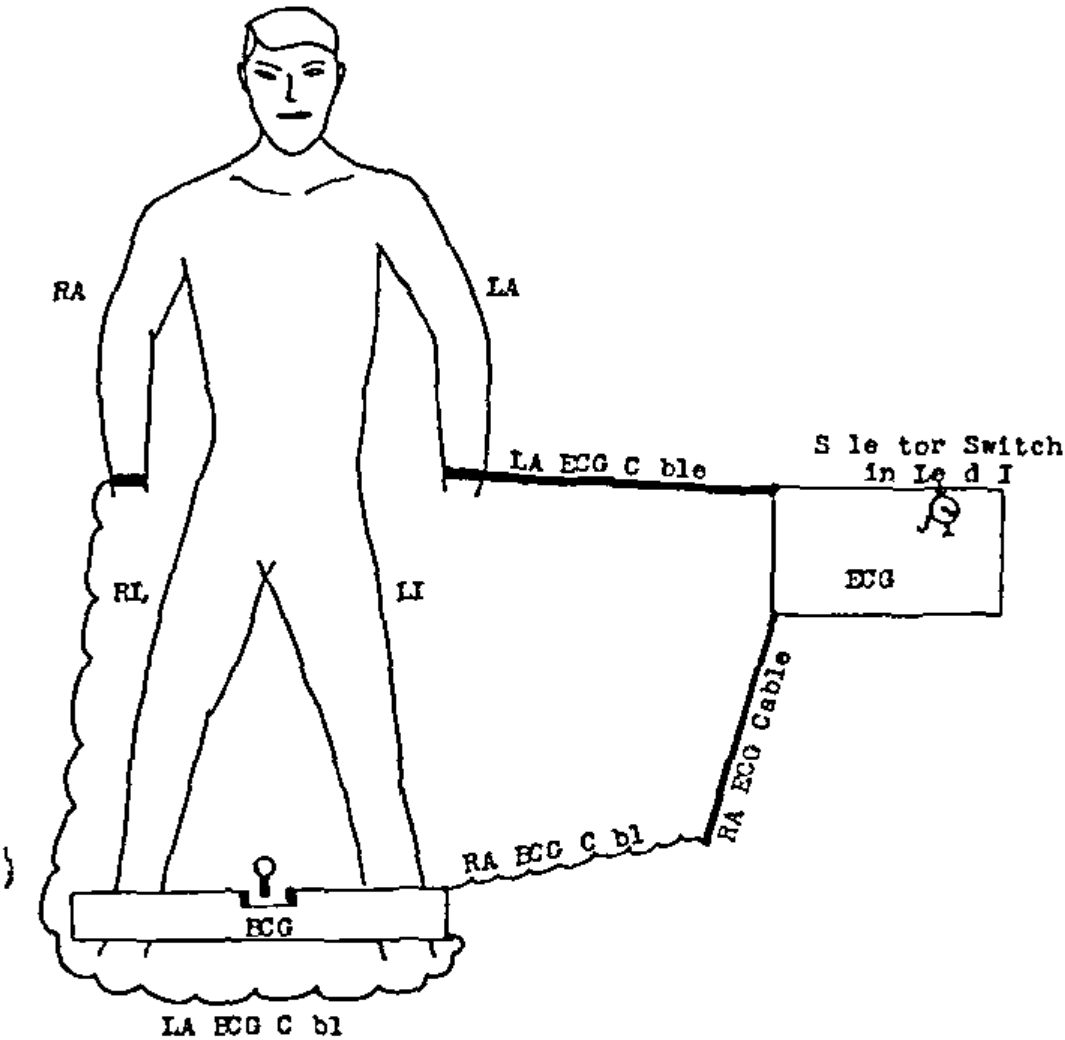


Figure 1 Ballistocard ograph and lectrocard g aph connect d t le through the pat t The pat t left arm is conne t d t the ual manne to the l ft-arm cabl of the lect oca di gr ph The ght arm of the p ti t (g an ordinary ext m ty elect od) is co ne ted to the l ft-arm cabl of the ballistoca d ograph The right-arm cable of the balli toc d ogr ph complete the circ it by connect on with the right arm cable f the ele tro c d ogr ph This g s the curve shown figur 2A whe the l ad le to swit b f the lectrocard graph o lead I

from the onset of the QRS complex *(3)* just as in a 2 channel recording In order to obliterate the ECG from the record, the rheostat resistance is increased to 500 000 ohms or more until the R wave is barely discernible the ballistocardiogram remains unchanged

Dock (5) indicated that the ballistocardiograph can be connected in series with the electrocardiograph through the patient and simultaneous inscription of records accomplished. Although this method is apparently known and used by many, it has not, to my knowledge, been illustrated anywhere, nor have records so obtained been published.

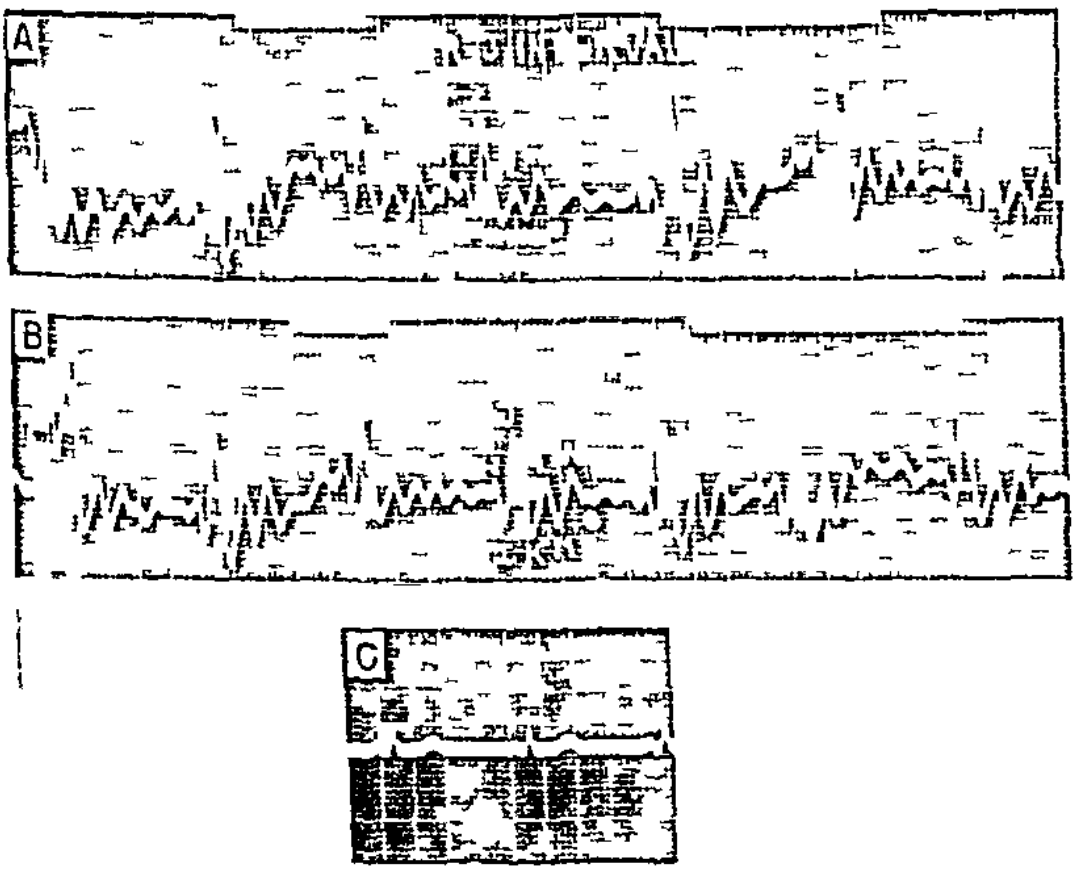


Figure 2 (A) *Simultaneous recording of ECG and ballistocardiogram in series through patient (1 mv = 1 cm.)* (B) *Ballistocardiogram without ECG (1 mv = 1 cm.)* (C) *ECG in lead I (1 mv = 1 cm.) The time interval from the onset of the QRS complex to the peak of the J wave is obtained by measuring from the peak of the R wave (ECG) to the peak of the J wave in* (A) *and adding to it the time from the onset of the QRS complex to the peak of the R wave in* (C)

An electromagnetic ballistocardiograph, of the type described by Dock (5) was used. Records were obtained at least 3 hours after the patient's last meal with the patient in the supine position, on a firm x-ray table, after having first obtained a 12 lead ECG. The connection of the patient in series, through the ballistocardiograph and electrocardiograph, is shown diagrammatically in figure 1.

Inspiration was marked on the record by holding down the lead marker, leaving a white strip on the upper edge of the tracing during this phase of respiration (fig. 2, A and B). The tracing

(5) Dock, W.: Personal communication.

was run during quiet, normal breathing (Any special phase of respiration may be obtained subsequently) With our ballistocardiograph optimal deflection in the normal was obtained with the galvanometer standardized at 1 cm -1 mv To be certain that footward deflection was inscribed downward on the tracing, the patient was tapped lightly on the shoulder at the beginning and end of the record.

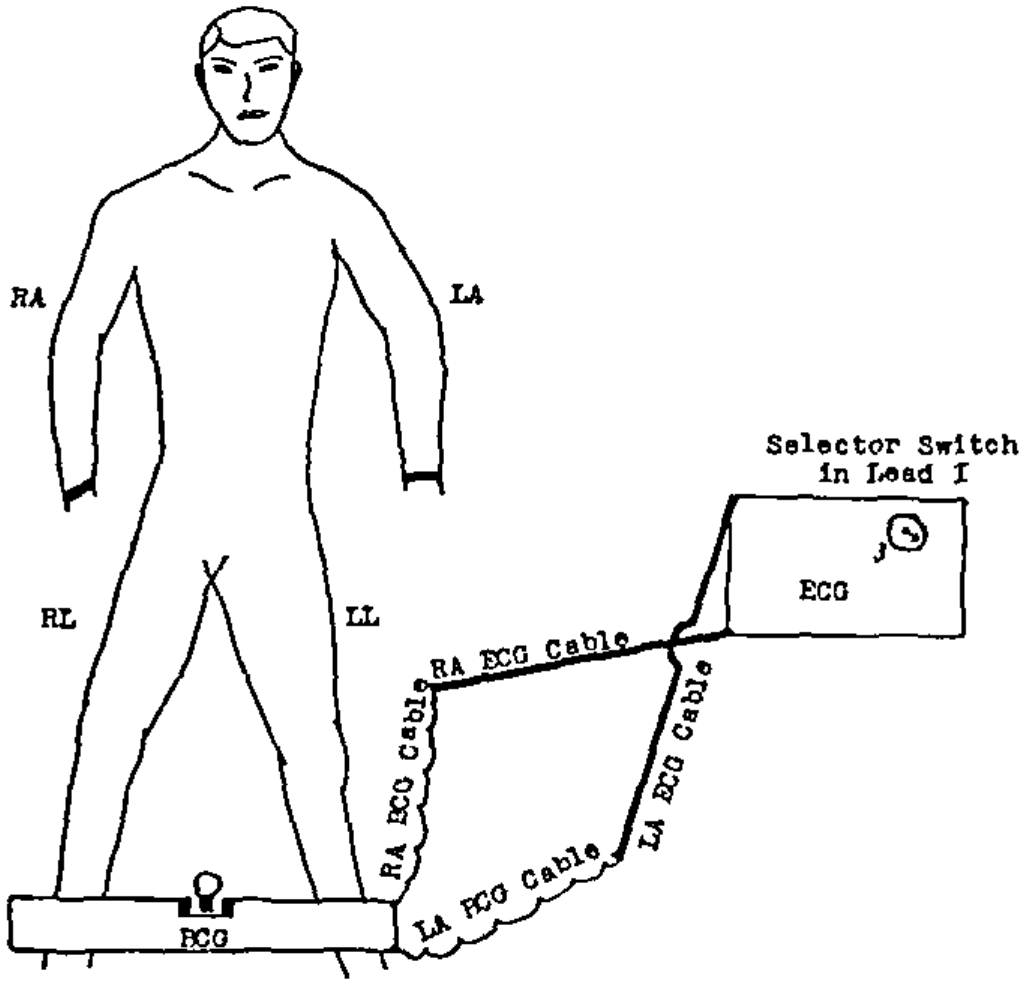


Figure 3 Ballistocardiograph connected directly to the electrocardiograph The left arm cable of the electrocardiograph is connected with the left-arm cable of the ballistocardiograph the right-arm cable are similarly connected to each other This produces the curve shown in figure 2B with the lead selector switch of the electrocardiograph in lead I

After recording the combined ECG and ballistocardiogram in series (fig 2A) the patient s arms were disconnected from the electrocardiograph and the ballistocardiograph wires were connected directly to the electrocardiograph (fig 3) This tracing (fig 2B) when placed under the synchronous record of the ballistocardiogram and ECG, showed clearly all the waves of the ballistocardiogram

The time interval from the onset of the QRS complex to the J wave by this method was 0.25 second (fig. 3, A and C). Certain abnormal tracings (6) showed prolongation of this interval. The relation of the H wave of the ballistocardiogram to the R wave of the ECG was indistinguishable from that obtained when recorded in parallel. It was further observed, using the parallel circuit of simultaneous recording of Gubner (7), that the rheostat served as an antenna for picking up alternating current interference, in spite of patient and electrocardiograph grounding, and rheostat shielding. With the series connections shown in this study, alternating current interference was much rarer. The only difference in apparatus was the elimination of the rheostat.

The alternating current interference with the parallel connection could be attributed to the use of an x-ray table in a room with high tension wires, but the same room and table were used for the series method. Gubner (7) indicated that he encountered the same tendency to pick up alternating current interference, but that by shielding the rheostat he had no trouble eliminating it. Another difference between the two methods is that in parallel connection the sensitivity of the galvanometer is less than when the events are recorded by connection in series. Although the method of connecting in parallel for simultaneous recording would appear simpler, in actual practice the series connections take no longer, and once mastered, the method is simple.

SUMMARY

Identification of ballistocardiographic waves can be simply accomplished by simultaneous recording of any event of the cardiac cycle. By connecting any electrocardiographic lead, in series, with a ballistocardiograph, simultaneous inscription in a single channel may be obtained. By disconnecting the patient's extremities from the electrocardiographic circuit, the ballistocardiogram may be singly recorded and compared with the dual record. This eliminates the necessity for multichannel recording in clinical ballistocardiography.

(6) Green, M. H. Unpublished data.
(7) Gubner, R. Personal communication.

BOOK REVIEW

Atl f Med c l Mycology by *Emma S dl Mos* B S B M M D Dir tor Departme t f P th l gy Ch r ty Hosp t l f L ia t N w Orlean Clin al P fe sor f P th l gy L St t U ty School of M d ci F llow Am c Soci ty f Cl c l P th l g st F ll w Am r C lleg f Phy ia M mb r As oc t f P th logist d B t log st C ll g f Ame an P th l g st Soc ty of Am B t ri l gist nd Am r c Soc ety f Tr p l M d c nd *Alb t L M Q ow* B S B M M D P th l g st Our L dy f th L k Sa ta m B ton R g L Cl c l A t t Prof or f P th l gy Lou St t U ty School of M d c F llow Amer n Soc ety of Cl c l P th l g t F llow C ll ge of Amer c P th l g t d A oci t on f P thol gist nd B t l g t Formerly A st t t th Dir ct D partme t f P th l gy Ch rity H p t l f Louis t N w O lea 245 p g ll trat d W ll m & Wilkins Co B ltimor Md p bl h 1953 P i $8

Although mycology is even older than bacteriology it is assuming ever increasing importance in clinical practice and laboratory diagnosis The authors association with the Charity Hospital of New Orleans has afforded them a large experience with the various methods used in the clinical and laboratory diagnosis of fungus diseases As a result, they have produced a well illustrated atlas designed primarily for the training of medical students residents and technologists This book makes good use of the visual aid technic of teaching Eighteen of the 25 chapters deal with specific fungi or clinical entities caused by them Other chapters cover the classification of fungi methodology immunology contaminants culture media, and terminology The propriety of including a formulary in this handbook of laboratory diagnosis is questioned

The numerous photographs which illustrate clinical and roentgenographic features colony characteristics of fungi on various culture media identifying microscopic structures and gross and microscopic pathology are generally well chosen It is difficult to account for the omission of any gross pictures or low power photomicrographs of the characteristic brain lesions of cryptococcosis

The authors have made a systematic comparison of colony characteristics of the various fungi on the conventional Sabouraud agar and on the newer Littman oxgall agar This should prove helpful to the clinical laboratory worker who has been confused by the different appearance of colonies on these two media Specific references are not provided for the individual chapters but a short bibliography precedes the index

—*Lt Col L E Zimmerman MC USA*

DENTOALVEOLAR ABSCESS

Preliminary Report of the Use of a Multiple Antibiotic and Fungicidal Preparation in Its Treatment

PAUL A. KROOKS *Captain, DC USAR (1)*

BECAUSE of the continued shortage of personnel in the Dental Corps, a sufficient amount of time to devote to prolonged root canal treatments has not been available Therefore a method which would meet the following requirements in treating dentoalveolar abscess or necrosis of the pulp due to traumatic injury, infection, or chronic irritation has been sought. (1) It must be therapeutically sound and clinically effective, (2) the materials must be readily available, durable, stable, and easily prepared, and (3) the technic must be simple, involve easily standardized equipment, and require a minimum of time

The successful use of a multiple antibiotic and fungicidal preparation (MABF), described by Bender and Seltzer (2), awakened interest at this clinic in its possible use on a large scale This report will indicate the technic which I have used In all but the first case, this technic was used in a routine manner

THERAPEUTIC AGENT

A 15 cc solution of chloramphenicol streptomycin, penicillin, and sodium caprylate was prepared by the pharmacy of the William Beaumont Army Hospital in the manner described by Bender and Seltzer

"* * * 200 mg each of streptomycin (chloride), chloramphenicol, and sodium caprylate were placed in a sterile mortar. These powders were well triturated for 10 to 15 minutes. To this were added a commercially available 1 cc aqueous suspension of 300 000 units of procaine penicillin G The entire mixture was again triturated for 5 minutes with a sterile pestle until a homogeneous mass was obtained "

Bender and Seltzer recommended further that this mass be transferred to used sterile procaine carpules, from which the

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(1) Dental Clinic Fort Bliss Texas [illegible] writing address [illegible]
Brooklyn 10 N Y

(2) Bender I B and Seltzer S Combination of [illegible] treatment of pulpless tooth J Am Dent A 45 293 Sept [illegible]

but instead drew the desired amount each time from a sterile bottle using a Luer Lok syringe No cultures were taken because if the technic were to be of value under the conditions which prevail in most clinics facilities for obtaining cultures not being available the necessity of taking cultures would then render the technic of little practical value For these reasons the root canals were filled and the case closed when there were no objective and subjective symptoms

CASE REPORTS

Case 1 On 27 October 1952 a 21 year old soldier reported to this clinic complaining of pain in the upper right central and lateral incisors The pain had started 2 days previously The tissue superiorly had begun to swell the day before and at the time of examination was only moderately edematous Roentgenograms showed large silicate fillings on the central and evidence of caries on the lateral incisors The apex of the lateral incisors showed moderate radiolucency The pulp of both teeth seemed nonvital

The teeth were isolated with cotton rolls and scrubbed first with alcohol then with merthiolate The instruments used were sterilized by boiling The root canals were opened and about 1 5 cc of MABF was flushed through each canal after it had been reamed and filed in a standard manner A sterile point was inserted into each canal and it was sealed first with gutta percha and then a layer of cement The patient was given 600 000 units of procaine penicillin intramuscularly, placed in quarters and told to use ice on the swollen tissues for 5 minutes rest 20 minutes, and repeat

On the following day the edema had increased pain persisted and the teeth were highly sensitive to percussion The dressing was removed from the teeth and the canals were left open for drainage The patient was given another 600 000 units of penicillin intramuscularly continued in quarters and told to continue to apply ice On the next day the edema and the pain had decreased The application of ice was continued and 300 000 units of penicillin was given On 30 October the patient had only a slight tenderness in the lip and slight edema He was given 300 000 units of penicillin and returned to duty On 3 November he had neither pain nor edema

On 7 November both root canals were filled with gutta percha points (in chloroform), and apicoectomies were performed on both teeth Sutures were taken and the patient was given 600 000 units of procaine penicillin intramuscularly By 11 November the incision had healed by primary intent the sutures were removed and the patient was discharged

Comment It was immediately apparent that there was something amiss either with the MABF solution or with the technic which was being used The pharmacy was requested to prepare a new batch of MABF, using greater care to prevent contamination, and the technic was revised as follows (1) A rubber dam was used consistently, (2) the area was scrubbed with alcohol for 2 minutes, followed by liberal washing with ether, (3) a root canal tray was prepared, wrapped in a towel together with the Luer-Lok syringe and needle (from which the point had been filed), and this kit was autoclaved and stored until used, and (4) when the symptom had subsided, a dam was again applied and the canal filled with gutta percha Because this technic was used routinely in the following case reports it will not be described again

Case 2 On 3 November 1952 a 24-year-old man reported to the clinic complaining of pain in the upper left lateral incisor, The tooth was nonvital and painful on percussion, but there was no edema The canal was flushed with MABF and sealed On 13 November the symptoms had subsided so the root canal was filled

Comment Each patient was given a letter explaining what had been done He was instructed to present himself to the nearest service clinic in 6 months for roentgenograms of the involved area, the roentgenograms to be sent to me,

Case 3 A 31 year old man reported to the clinic on 5 November 1952 complaining of pain in the upper right lateral incisor noted only while chewing The incisor was nonsensitive to percussion and nonvital The roentgenogram revealed a small lucent area at its apex The canal was opened, and was treated with MABF On 4 December the patient reported no further discomfort so the canal was filled with gutta percha

Case 4 A 29 year-old man reported on 25 November to the clinic stating that about 15 days earlier a small swelling in the upper lip above the left lateral incisor appeared, swelling disappeared but about 5 days later a pimple appeared on the teeth, he pressed against the gum above the pimple and a small amount of fluid began to drain from a raised opening in the gum The swelling and draining had recurred intermittently since roentgenograms revealed a large, irregular, radiolucent area surrounding the apex of the lateral incisor There was a small opening in the labial mucosa 7 mm above the mucogingival junction, which was cleaned and treated with MABF, and the pimple and swelling had disappeared There was a slight depression in the gum at the spot where the fistula had opened The opening was closing or beginning to close The patient has not returned

so the root canal was filled The fistulous opening had completely disappeared by 13 December

Case 5 On 2 December a 21 year old man reported to this clinic complaining that in the preceding 2 days the upper right central incisor had been sensitive to cold At the time of examination he had a steady dull ache in this region The tooth had been filled with silicate 4 or 5 years earlier It was extremely sensitive to percussion at the time of examination The root canal was opened for drainage and left open until the following day at which time there was no pain or edema It was cleaned and treated with MABF By 12 December there were still no symptoms so the canal was filled

Case 6 A 28 year-old man reported to this clinic on 8 December 1952 complaining of an aching pain in the upper right cuspid of 2 days duration associated with swelling in the infraorbital fossa Roentgenograms revealed radiolucency at the apex of this tooth The canal was opened and left open for drainage On 9 December the canal was cleaned and treated with MABF On 16 December the symptom had subsided so the canal was filled

Case 7 An 18 year-old man reported to this clinic on 12 December 1952 complaining of a dull ache in the upper right lateral incisor off and on for about 6 weeks There was neither pain nor soreness to percussion at the time of examination A rarified area had been discovered at the apex of this tooth in a roentgenogram The tooth was opened cleaned and treated with MABF On 19 December the symptoms had cleared up so the root canal was filled

Case 8 On 22 December 1952 a patient reported to the clinic complaining of an intermittent throbbing pain in the upper left central incisor of 1 day s duration The tooth was nonvital discolored and sensitive to percussion There was no edema in the supportive tissues The tooth was opened for drainage and on 23 December treated with MABF On 31 December the symptoms had subsided so the tooth was filled

Case 9 A 21 year old man reported to the clinic on 10 December 1952 complaining that the upper left lateral incisor was sensitive to percussion On the previous night he had had severe intermittent pain radiating from the area The tooth was partially vital giving evidence of sharp pain on the application of either heat or cold It was opened under anesthesia the canal was reamed cleaned and left open for drainage On 11 December there being no pain on percussion nor other manifestation of

inflammation, the tooth was treated with MABF On 23 December the canal was filled

CONCLUSIONS

The use of MABF in the treatment of pulpless teeth is a highly effective method of controlling infectious processes. The method of treatment can be standardized to facilitate its routine use

No undesirable side reactions were observed once the technique had been standardized The first patient was the only one who complained of pain subsequent to the use of MABF

Further study of the mechanism of action of the drug is indicated This report was submitted in the hope that it might stimulate others to attempt the use of MABF

BOOK REVIEWS

Human Factors in Air Transportation Occupational Health and Safety by Paul A. *McFarland* Ph D Associate Professor of Industrial Hygiene Harvard School of Public Health 830 pages Illustrated McGraw Hill Book Co Inc New York N Y publishers, 1953 Price $13

If I could ever be credited with having written a book, this new book of McFarland's is one I would be proud to have written It is a learned compilation of the present state of the knowledge of human factors in flying The aero medical, human engineering, and social scientists engaged in forwarding flying progress could well re-evaluate their orientation by reference to this volume so as to find the deficient areas in the human factor of aviation and then to proceed in these weak areas Every flight surgeon, airline medical director, and flight examiner will find here an encyclopedia of human factor knowledge to supplement current texts of aviation medicine, aviation psychology, et cetera The aircraft designers and other "hard scientist" will find in this volume a fitting companion to McFarland's other volume "Human Factors in Air Transport Design" and thus will insure proper consideration of the man in future aircraft, be that man an operator or a passenger The pilots will find here the answers to many of their questions and an explanation of why their medical departments frequently react as they do

The size of this volume with its text, charts, references, index reveal that this is no short and easy flight for the

Rather, it is a learned, detailed, carefully written and carefully edited book It contains very few errors The author is to be praised for his inclusion of scores of figures, charts, and graphs to supplement the text, and much could be learned simply by studying these figures An opening sentence in each chapter stating the subject and the approach to be followed in the pres entation and the excellent summaries at the end of each chapter facilitate the use of this book An extensive bibliography ac companies each chapter

I happen to have been an observer at a meeting in which experts on sound attacked the author s views on auditory surveys (starting on page 477 of the present text) and I can state that this dis cussion terminated with the acknowledgement that the premises of this book are tenable and the conclusions sound Here as in all the other chapters, much of the detail of what is known has had to be omitted in order to present this broad subject in a single volume The author's knowledge of psychology, his long research in and teaching of biologic sciences and his love for and experience in aviation have enabled him to use the specialized language of each but makes it necessary for a person of more limited background to use the dictionary and the basic references frequently —*A H Lawton M D Ph D*

Direct Analys Sel ted P p r by *Job N Ro n* M. D 184 p ge Grun & Stratt N w Yo k N Y p blishers 1953 P $3 75

This book consists of a number of papers most of which have been published in periodicals in the past 6 years The term "direct analysis" refers to the specific technic Rosen has de veloped in the treatment of schizophrenic patients Instead of using long hours of free association with little interpretation as is the case with neurotics Rosen interprets the schizophrenic s symptoms and productions directly No free association is used In so doing, Rosen uses plain everyday language with a liberal sprinkling of good old fashioned Anglo-Saxon words which leave no doubt about their meaning He enters the patient s fantasies when necessary He may use restraint or even engage in physical combat during critical phases of treatment when the patient s aggression is suddenly released He reports many successfully treated patients one of whom had been ill for 27 years Although the author admits he does not understand all that occurs during treatment, his method is certainly challenging The book is clear and is singularly free of psychoanalytic jargon It is fascinating reading and should be read by all serious students of psychiatry

—*Lt Col J F Tuttle MC USA*

AN EPIDEMIOLOGIC STUDY OF TUBERCULOSIS IN CIVILIAN EMPLOYEES

JAMES R MATHEWS *Lieutenant junior grade* MC, USNR (1)

IN May 1952, a roentgenographic survey of all civilian employees of the Overhaul and Repair Department at this station was conducted The Industrial Medicine and X Ray Departments insisted that all employees be x-rayed The industrial medicine officer devised a system by which none would be missed Punch cards were made for each employee, and as he appeared for his roentgenogram, the card was stamped with the x-ray serial number and the date His age, weight, height, and place of birth were also recorded on the card When the films had been read, the findings were reported on the cards Those employees whose cards had not been used were called individually until all had been x rayed About 3,300 men and women were x-rayed

At this time, 8 employees were found either to have tuberculosis or to have a suspicious lesion which later proved to be tuberculosis All but 2 had worked in the Overhaul and Repair Department 4 years or more One of these 8 employees (case 1) had concealed an active tuberculosis for at least 3 years Of the remaining 7, cases 2 3, and 4 were from the same division (power plant) and at least one of them (case 2) worked in close contact with case 1 Another employee from the same division (case 9) had been found to have tuberculosis in the preceding year He had also worked in close contact with case 1

Of the other 4 found in this survey, case 5 had been in the Planning and Engineering Division of the Overhaul and Repair Department for 1 year, and another (case 6) worked in the Plant Maintenance Division of the same department Both of these men had jobs which took them to most of the other divisions in the department Cases 7 and 8 worked in divisions where they were not apt to have had extensive contacts with members of other divisions

Besides the 8 patients found in this survey and the 1 from the previous year 2 others had brief contacts with the Overhaul

(1) U S. Naval Air Station Jacksonville Fla.

Repair Department One man was transferred here from another naval base in March 1952 and on a routine roentgenographic survey was found to have active tuberculosis He worked in the Production Office where he would have had close contact with case 5 in the Planning Division. He was here for only a few days before the lesion was found and he was removed from the job and admitted to the hospital The other was a clerk typist who had previously been treated and had begun to work in April stating that she had been told her disease was arrested Although a review of her case suggested that she should not yet return to work about 2 months had elapsed before this was determined during which time she also worked in the Planning Division.

It is possible that case 5 might have contracted tuberculosis from one of these latter two although he had had contact with most of the other departments too

CASE REPORTS

Case 1 This man was treated for tuberculosis in 1932 again in 1941 and 1942 and was subsequently followed by the Veterans Administration as an outpatient He was employed in the Over haul and Repair Department in 1943 at which time it was thought that his tuberculosis was arrested In 1949 because of suspi cious looking changes on his roentgenograms sputum studies were made and found to be positive He was advised to enter a Veterans Administration hospital but he refused to do so The city health department was notified and both agencies were ap parently under the impression that he was being treated at home Neither was aware that he had been employed at this station He successfully concealed his infection for at least 3 years During this time he was in the same departments with cases 2 3 4 and 9 and worked with cases 2 and 9 constantly In addi tion he had transient contact with cases 5 and 6 He was found to have active moderately advanced tuberculosis in the May 1952 survey Although he had worked at this station since 1943 he had never had a chest roentgenogram by the Navy because he had always absented himself from work on the days roentgenographic surveys were made He had managed to do this for 9 years be cause accurate lists of employees who did not report to be x rayed had not been kept

Case 2 This man, employed here since 1942 worked in the power plant in close contact with case 1 He was found to have active moderately advanced tuberculosis in the May survey Cases 1 and 2 spent most of their time in the power plant but their jobs occasionally took them to other divisions This man had had a negative 70-mm roentgenogram in December 1950

Case 3 This man had worked in the power plant since 1943, but his contact with cases 1 and 2 was casual A roentgenogram taken in August 1951 showed a lesion similar to the one found in the May survey Because of a slight difference in the 2 films, however, he was referred to his family physician, who believed that the disease was active

Case 4 This man had worked in the power plant since 1946, in a contact situation similar to that of case 3 He had been treated by the Veterans Administration in 1949 and 1950 for active tuberculosis and was being followed by them Because of a change in his roentgenographic findings, he was referred back to the Veterans Administration where further examination revealed evidence of active disease

Case 5 This man began work in the Planning, Engineering, and Personnel Division in April 1951, at which time he had a negative 70 mm roentgenogram In May 1952, suspicious looking findings were noted and he was referred to his family physician, who believed that he had active minimal tuberculosis and referred him for hospitalization His work had put him in contact with most of the other divisions in the department, including the power plant

Case 6 This man had worked in the Plant Maintenance Division since 1948 in a job which took him to most of the other divisions He had been hospitalized in 1949 with "pleurisy" While in the hospital, a diagnosis of rheumatic carditis was made, and a roentgenogram at that time showed normal lung fields In the May survey, he was found to have active minimal tuberculosis

Case 7 This man had started to work in the Radio Repair Division in November 1951 (6 months before the survey was made) At that time he had a negative 70-mm roentgenogram In the May survey, a small peripheral shadow was found, which, at the time, was thought to be a small area of pleural thickening Serial films were taken at bimonthly intervals A film taken in August showed no apparent change, but, in retrospect, there was a question of a slight change in the shape of the lesion In September, the patient had a "severe chest cold," which lasted for 3 weeks A roentgenogram in October showed a cavity 2 5 cm in diameter with marked infiltration around it, and the patient's sputum was found to be positive for tubercle bacilli

Case 8 This man had worked in the Processing Division in a fairly stationary job since 1941 He had been recalled in 1951 because of what was believed to be an old, inactive tuberculous lesion Serial roentgenograms had been suggested at that time In the May film no change was apparent but the serial films were

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A MODIFICATION OF THE ILEOCOLOSTOMY

With Exclusion Operation for Terminal Ileitis

HAROLD F BERTRAN *Lieutenant Colonel MC USA (1)*

ALTHOUGH terminal ileitis has been recognized as a definite clinical entity for over 20 years *(2)*, the cause is still unknown and the treatment is unsatisfactory Medical, radiologic, and surgical therapeutic measures have been tried I believe that medical treatment should be continued so long as it maintains the patient as a useful, self supporting member of society, able to enjoy his life and that surgical treatment should be offered the patient only when medical treatment fails The standard surgical procedures are excision of the involved segment of the intestinal tract and of ileocolostomy with exclusion, as popularized by Garlock *(3)*

I have used the latter, with a minor modification, because (1) it is definitely a safer procedure (the mortality is practically zero), (2) according to available statistics, it offers as good, if not better, long term results and (3) if this procedure fails to relieve the patient s symptoms, we may still resect a part of the intestinal tract as a last resort. Regardless of the surgical procedure used, the recurrence rate is discouragingly high *(4 8)*

Garlock used a left midrectus incision because it eliminates the possibility of having to work through an inflammatory mass

(1) U S Army Hospital Fort Campbell Ky

(2) Cr hn B B G nzburg L and Oppe h mer G D Regional l ti pathologic and cl n cal entity J A M A 99 1323 1329 Oct 15 1932

(3) Garlock J H Pr ent st tus of pr blem of reg onal le tis Am J Surg 72 875-878, Dec 1946

(4) Garlock J H nd Cr hn B B Appr s l of r s lts of surgery i tre tment of regional il ti J A M A 127 205-208 J 27 1945

(5) Hawthorne H R and Frobese A S Chr n c t osing egi n l nt t tis—sur g cal pathol gy nd pers n e n urg cal tr tme t A Surg 130 233 241 Aug 1949

(6) Bockus H L Pre nt st tus of chro reg onal or c triz ng nter t s J A M A 127 449-456 Feb 24 1945

(7) W tre R and M ller R H R gional e t r t t port of 43 cas s New England J Med 226 589-593 Apr 9 1942

(8) Garlock J H Cr hn B B Mel S H and Yar H Appraisal of lo g t rm results of urg c l treatment of reg onal ileit Gast roe t rology 19 414-423 N v 1951

to find uninvolved bowel and it leaves the right side of th domen as free of adhesions as possible in case a resecti necessary later This incision by avoiding the involved lessens the chance of formation of a fistula Existing fist should be left absolutely alone because they heal spontaneo after exclusion It is important to transect the bowel proxim the site of involvement before ileocolostomy is performed Gar stated that ileocolostomy in continuity gives no relief and fact often makes the patient worse

After transecting the bowel proximal to the most proxi lesion Garlock closed the distal end and replaced it in peritoneal cavity He believed that after this procedure inflammatory process would subside Many conservative s geons however condemn this procedure because they belie that as the bowel heals, after it has been short-circuited, often becomes stenosed by scar tissue It would then be possil for a closed loop obstruction to develop between the stenos area and the surgically closed end of the ileum This could co ceivably result in distention perforation peritonitis, and ev death At the very least this would be a troublesome and di concerting complication It was to circumvent this possibili that the procedure to be described here was adopted This o jection to Garlock s procedure could be met by bringing out th distal end of the ileum as a mucous fistula A mucous fistula i not so objectionable as an ileostomy or a colostomy, but it pre sents conditions that are undesirable to most patients I be lieve that the procedure to be described (and which I did not originate) circumvents the objections to both of the other pro cedures

After the diagnosis of terminal ileitis is established the pa tient is prepared in the manner usually used for operations on the colon The abdomen is opened through a left midrectus in cision Sufficient exploration is done to confirm the diagnosis Then because the presence of skip areas* between areas of involvement is common in this disease and to avoid transectin the ileum through one of these skip areas and distal to an area of involvement the ligament of Treitz is identified The small bowel is traced distally from this point until the first area of involvement is encountered It is then traced for 18 inches proximal to any gross vement At this point the l is transected The proxir is anastomosed to the s transverse colon (I h uarrel with surgeons side to-side re-establis ntestinal continuity) end of the ileum is clos manner used to cl denum in a gastric resec is point the oper from that of Garlock The tal end is broug through the left midrectus he split mesen

small bowel is sutured to the peritoneum of the anterior abdominal wall, from the incision to the ileocolostomy, to avoid a possible internal hernia. The left mucus fistula is then closed around the blind distal end of the terminal ileum in a mass including the subcutaneous fat. The skin is then closed over the end of the terminal ileum (Fig. 1 - and B -.

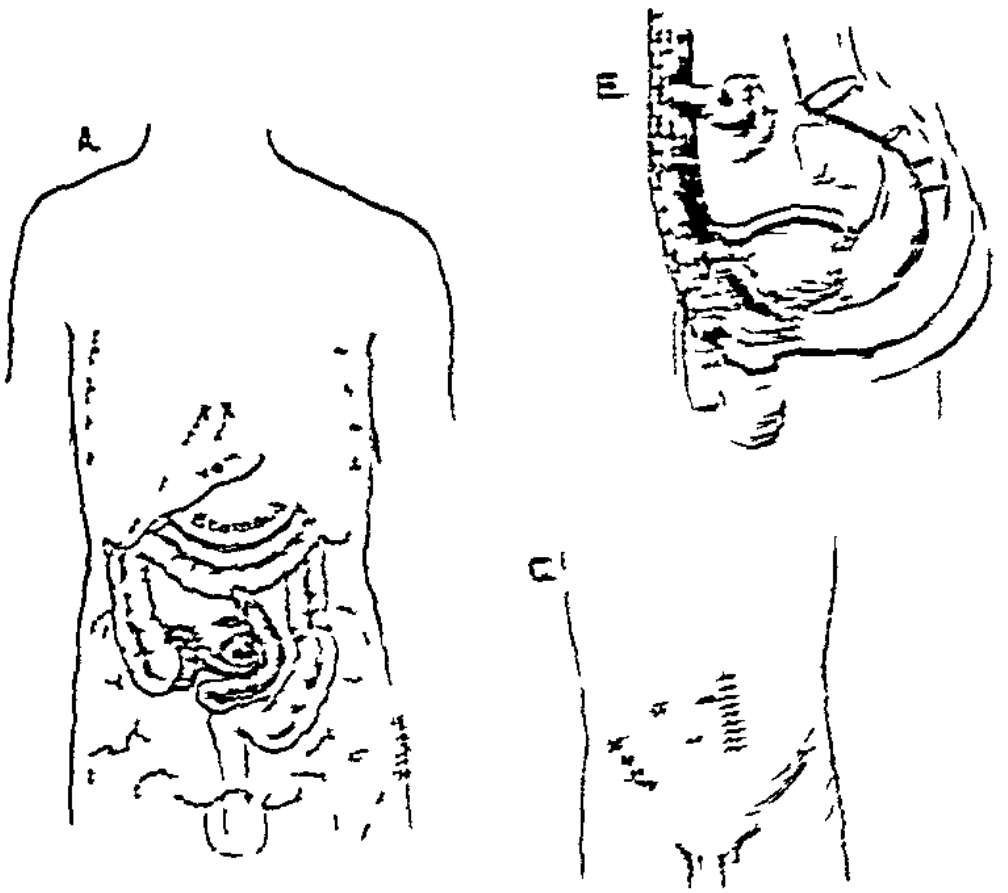


Figure 1 *Diagram of completed operation (A) Front view (B) Side view (C) Case I after completion showing fistulae and incision.*

With this procedure if the patient develops signs of a closed loop obstruction a surgeon can under local anesthesia, reopen a mucous fistula similar to previous the skin and bowel immediately beneath the scar. Before discharge the patient is given a diagram of his operation with the incision drawn in. The spot on the incision where the blind loop is buried is marked and referred to the umbilicus and the anterior superior spine of the ilium. The patient's diagnosis is also written on the diagram to avoid confusion. With this information any physician can provide emergency treatment for a closed loop obstruction and prevent the unpleasant complication of perforation. I have used this procedure in treating 2 patients without undesirable complications.

CASE REPORTS

Case 1 A man was operated on on 2 February 1949 He had had an appendectomy several months previously He had lost about 50 lb and had had 3 operations to drain abscesses about his appendectomy incision He had 4 fistulas opening on his abdominal wall (fig 1C) Within 10 days after ileocolostomy with exclusion his fistulas had closed spontaneously and he was free of pain He had no diarrhea He regained his weight within a few months and has retained it for over 3 years He worked for a time *in a steel mill and then rejoined one of the Armed Services When* last heard from 3 years after operation he weighed 187 lb and was taking training in a parachute rescue squadron

Case 2 A man was operated on on 28 February 1949 for terminal ileitis He had had symptoms for 6 years An appendectomy had been performed previously and the diagnosis of terminal ileitis was established at that time Because of pain weight loss and diarrhea he sought relief Following ileocolostomy with exclusion he was free from pain gained 35 lb and held his weight except during the summer months He had an average of 3 soft bowel movements daily but was able to carry on a useful and happy life

Case 3 A man was operated on on 25 May 1951 He had had symptoms for 2 years Nine months after the ileocolostomy with exclusion he had gained 15 lb He was free from pain and had no diarrhea except after 2 episodes of excessive use of alcohol He also performed duty as a naval combat pilot, completing his share of combat missions over Korea

None of these patients developed an incisional hernia

SUMMARY

A modification of the procedure advocated by Garlock was used on 3 patients. This operation meets the objection of conservative surgeons that as the bowel heals it may become stenosed by scar tissue It also avoids the inconvenience to the patient of a mucous fistula

SUBCOMA, COMA, AND CONVULSIVE CARBON DIOXIDE THERAPY[1]

WILLIAM E WILKINSON *Colonel, MC USA*

MANY psychiatrists are now using neurophysiologic measures to relieve the symptoms of various nervous and mental illnesses Although Meduna (2) used carbon dioxide therapy with success, there is still much criticism of the use of such measures Most of the psychiatrists who have spoken or written about the beneficial results obtained by the use of the neurophysiologic measures have stated that these methods are empirical. Therefore, it would seem that there is a justification for this criticism and if those of us who use these methods are to be scientific, we must make every effort to determine how and why we modify the courses of illnesses by the treatments that we are using I have previously reported (3–5) certain observations pertaining to electroshock therapy which give some indication of the modus operandi of this particular treatment This article is an initial effort to clarify some of the theories concerning the physiologic and psychologic changes which occur in patients who are undergoing carbon dioxide therapy I have administered carbon dioxide to over 200 patients The illnesses which have been treated include schizophrenia, manic depressive psychosis, the various types of benign affective disorders, hysteria, psychoneurosis, and numerous psychosomatic illnesses

Although the idea that patients receive no benefit from carbon dioxide therapy unless unconsciousness is produced by the administration of the gas mixture (30 percent carbon dioxide and 70 percent oxygen) seems to be prevalent, the physicians

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(1) Read before meeting of the Southern Psychiatric Association White Sulphur Springs W Va 4 Nov 1952

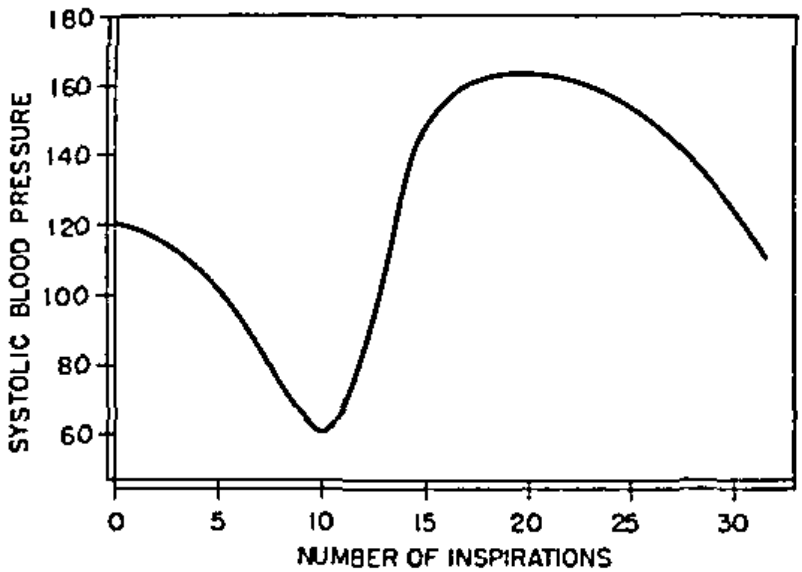
(2) Meduna L. J Carbon Dioxide Therapy A Neurophysiologic Treatment of Nervous Disorders Charles C Thomas Publisher Springfield Ill., 1950.

(3) Wilkinson W E Observations pertaining to electric shock therapy somatic manifestation Dis Nerv Syst m 13: 227 232 Aug 1952

(4) Wilkinson W E Observations pertaining to electric shock therapy autonomic manifestations Dis Nerv Syst m 13 3-7 Dec 1952

(5) Wilkinson W E Observation pertaining to electric shock therapy effects of central drug Dis Nerv System In press

with whom I have talked agree that the degree of unconsciousness produced by carbon dioxide is extremely variable from patient to patient and even in the same patient from treatment to treatment Some patients say they "passed out" some that they went to sleep some that they were knocked out a few have said they dreamed but did not go to sleep" and others have said that they floated away I have elected to use the term coma" to describe this change in consciousness because it is easier to say "subcoma" than to use some expression such as "subunconsciousness "



F gur 1 Cha cteristic blood pressure curv

SUBCOMA THERAPY

In some patients there is evidence of a preponderance of parasympathetic activity at the beginning of a treatment but when the patient has received from 12 to 20 inhalations of the gas there is usually a marked response on the part of the sympathetic nervous system If the treatment is continued to the point of producing unconsciousness however, there is sometimes a second parasympathetic re ponse A characteristic blood pressure curve for such patients is shown in figure 1 Other patients had a sympathetic response initially and did not have a delayed parasympathetic response A few patients responded only with a parasympathetic reaction throughout the treatment. As a result of the observations which previously have been made concerning autonomic response to electroshock therapy *(4)* it was decided that depressed patients who had a preponderance of parasympathetiklike symptoms might respond better if the treatment were discontinued at the level of sympathetic response Because this sympathetic level usually occurs before the patient becomes unconscious I soon found myself

giving many patients subcoma treatments It has been gratifying to observe that most of these depressed patients have been relieved of their parasympathetiklike symptoms with the subcoma treatments Therefore, I no longer use unconsciousness per se as the determining factor in deciding how much gas to administer in any one treatment.

COMA THERAPY

Patients who have psychoneurotic symptoms, but who are not depressed, have, in my experience, either not been improved or have been made worse by treatments which did not produce unconsciousness Such patients now are routinely given coma treatments The nature of the altered state of consciousness which occurs in patients who have been given a coma treatment without producing a convulsion is of interest. Unless there has been a convulsion, the "extinction of personality" *(6)* which occurs following convulsive electroshock does not occur Many of these patients have had dramatic reactions during and following the treatment Several patients have stated that they had an ecstatic experience and that they discovered the universal truth Unfortunately they were unable to remember the solution when they awakened! Many have shown signs of violent autonomic nervous system discharge frequently accompanied by violent muscular activity Several patients have screamed and yelled for long periods of time Others have had uncontrollable fits of laughter or crying and sometimes the fits of crying and laughing alternate in the same patient One or two patients have cried and laughed at the same time

When these reactions are observed carefully, they sometimes give the impression that the patient has been stimulated into having the reaction For example, one of the patients who had an ecstatic experience was very depressed prior to the treatment and was hypomanic after the treatment. On the other hand, other patients seemed to have these reactions as a form of catharsis One tense, tremulous young man was given 0 15 mg of epinephrine intravenously prior to the institution of treatment and this caused him to have a severe anxiety attack associated with a feeling that his heart was going to jump out of his chest. His tremor was exaggerated tenfold He then received 5 carbon dioxide treatments, during each of which there was a marked sympathetic autonomic response accompanied by rather violent somatic activity The intensity of these responses decreased with each successive treatment. Following the fifth treatment, he was again given epinephrine intravenously and his only reaction was a slight increase in pulse rate and blood pressure

(6) Lowenbach, H., and Stainbrook, E. J.: Observations on mental patients after electroshock, Am. J. Psychiat. 98: 828-833, May 1942

with no subjective symptoms He and others like him have said that the treatments made them feel less tense restored normal sleep, and improved their appetite Such observations have led us to believe that the carbon dioxide (1) stimulates the central nervous system and probably the endocrine gland system and (2) facilitates the release of pent-up psychic energy

CONVULSIVE THERAPY

We have used convulsive carbon dioxide therapy on patients who previously would have been given convulsive electroshock therapy This group has included patients with schizophrenia, obsessive-compulsive neurosis and those with the manic and agitated depressed phase of manic-depressive psychosis These patients have shown tremendous variations in their convulsive threshold and in the intensity and duration of the convulsion Following the carbon dioxide-induced convulsion the patients go through the several stages of the awakening reaction *(3)* not unlike patients recovering from electric convulsive therapy Patients who have been treated by this method usually have shown temporary relief of symptoms immediately after the treatment but in most of them the improvement has not lasted for as long as 24 hours *(7)* A few patients have been completely relieved of their symptoms but all of these were treated in the past year and we do not know how permanent the relief will be

DISCUSSION

Many of the patients with so called psychosomatic reactions as their chief complaints symptoms which seemed to indicate vity or decreased activity of one or the other branches of the autonomic nervous system or one of the several possible combinations of autonomic imbalance Frequently these patients denied any mood disturbance and no evidence of such disturbance could be obtained by talking to members of their families The principal symptoms that we have encountered in such patients are listed in table 1 Not infrequently during the treatment of these patients a depressive mood disturbance appeared at the time that their somatic complaints were relieved Three such patients have become depressed to the point of being suicidal Because the depression became manifest as the somatic symptoms disappeared the depression and the somatic symptoms seem to be related This leads us to wonder whether these somatic symptoms should not be considered as depressive equivalents, and further suggests the possibility that some people are so constituted that they develop somatic complaints rather than a classical affective disorder and that their symptoms are perhaps defensive mechanisms When these symptoms

(7) Loe hart A. S. Lorenz W F nd W ter R. M. Ce br l umulat on J A. M. A. 92 880-883 Ma ch 16 1929

are then removed, the defensive mechanism is broken down and an affective disorder becomes manifest. One bit of evidence in favor of this hypothesis is the observation that 2 hysterical patients whose hysterical symptoms were relieved by carbon dioxide became suicidally depressed The possibility that the carbon dioxide treatments themselves may have produced a depression which had no relation to the somatic symptoms must also be considered Interestingly enough, the patients that have become suicidally depressed during carbon dioxide therapy have been relieved of their depression by electroshock therapy

TABLE 1 *Psychosomatic symptoms*

1 Dry mouth	1 Rhinorrhea
2 Dry eyes	2 Tearfulness
3 Pounding heart	3 Fluttering heart
4 Tenseness and tremor	4 Fainting spells
5 Panting	5 Smothering spells
6 Localized sticky sweating	6 Generalized watery sweating
7 Goose skin	7 Warm flushed skin
8 Fearfulness	8 Crying spells
9 Loss of appetite	9 Abdominal cramps
10 Feeling of wanting to scream	10 Lethargy
11 Insomnia	11 Drowsiness
12 Inability to be still	12 No energy
13 Controllable urinary frequency	13 Uncontrollable urinary frequency
14 Spastic constipation	14 Diarrhea
15 Stomach in a knot	15 Vomiting
	16 Urticaria
	17 Pain

Two schizophrenic patients who were only mildly depressed prior to the institution of carbon dioxide therapy became suicidally depressed following convulsive carbon dioxide treatment The carbon dioxide therapy had been instituted as a last resort on a purely experimental basis before recommending lobotomies Both of them were immediately and completely relieved of all depression on awakening from the anesthesia following their lobotomies The results in these 2 patients substantiate a theory advanced in an earlier article *(3)* that one of the effec of electroshock on patients with a depression is a remov inhibitory influences which emanate from the cortex and e dampening effect on thalamic or hypothalamic structures

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(7) Loe hart A. S. Lorenz W F nd W ter R. M. Cer bral circulat ion J A. M. A. 92 880-883 Ma h 16 1929

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Two postlobotomy patients who became depressed several months after operation were relieved of their depression by a few stimulating subcoma carbon dioxide treatments

CONCLUSIONS

The symptoms of nervous and mental illnesses are frequently relieved by the administration of carbon dioxide in subcoma, coma or convulsive doses Simple depressive mood disturbances seem to respond best to stimulating subcoma treatments Psychosomatic illnesses with symptoms indicative of overactivity of the parasympathetic division of the autonomic nervous system likewise respond best to subcoma therapy Psychosomatic illnesses with a form of anxiety and other symptoms indicative of overactivity of the sympathetic division of the autonomic nervous system respond best to coma therapy

Obsessive-compulsive states manic states agitated depressions and paranoid conditions are sometimes relieved by subconvulsive coma therapy but seem to respond best to convulsive therapy The relief of simple depression by carbon dioxide therapy seems to be due to the stimulating effect of the gas mixture on central nervous system structures and endocrine glands which have to do with autonomic nervous system activity Tension states seem to be relieved by a catharsis of pent up psychic energy through somatic and autonomic channels Subcoma carbon dioxide treatments seem to set off this catharsis The work of Lorente de Nò *(8)* supports my conclusion that low concentrations of carbon dioxide increase the ability of nerve tissue to release energy

Symptoms such as obsessions compulsions feelings of guilt and paranoid ideas which may allegorically at least, be thought of as resulting from reverberating circuits are possibly relieved by high concentrations of carbon dioxide through the ability of the gas to cause a cessation of the spontaneous rhythmic firing of impulses in nerve tissue *(8)*

(8) L t d N R Q ed by M d na L J Ca b D ox d Th rapy A N uro phy l g l T tm f N rv us D ord Cha l C Thom P blish Spr ngf l l Ill 1950 pp 15 16

TEST OF CHRONIC TOXICITY OF IODINE AS RELATED TO THE PURIFICATION OF WATER[1]

DONALD P MORGAN *Lieutenant junior grade MC USNR*

RAYMOND J KARPEN *Lieutenant Colonel MSC USA*

IODINE, made available in low and well-controlled concentrations by organic iodine liberating compounds, is effective in the disinfection of drinking water The purpose of this investigation was to determine whether prolonged use of drinking water containing small amounts of iodine is deleterious to health

Troops in the field are normally supplied with potable water by (1) engineer operated water points using standard procedures, or (2) distillation of sea water Regardless of the source, chlorination of water is at present the minimum acceptable treatment

In the absence of a central source, small groups may purify water by (1) adding purification tablets to water clarified by a standard 1/4 g p m hand operated, pad type filter, or (2) chlorinating water in Lyster bags ordinarily of 36 gallon capacity A person may purify water in canteen quantities by means of the purification tablets alone As a final recourse, water can be boiled 1 minute to destroy the pathogens, but this method is often impractical because of lack of fuel and security restrictions

During World War II, tablets containing about 4 mg of halazone per tablet were issued for individual use, and complete instructions were given as to the method of use Although this method probably produced potable water in most instances great concern arose as to the efficacy of the sterilizing agent in cold water, in water containing much organic material, and in water bearing such pathogens as amebic cysts To study this problem a contract was initiated in October 1942 between the Office of Scientific Research and Development and Harvard College to investigate the destruction of amebic cysts in drinking water with

(1) Project NM 005 045 Report No 1 from the Division Bureau of Medicine and Surgery Department of the Navy The complete and detailed report of the project is on file in Research Division Bureau of Medicine and Surgery Department of the Navy Washington D C The authors are grateful to Capt L B Marshall MC USN for considering the report for publication

a special HTH Na_2SO_3 bag devised by Colonel W S Stone, MC USA This contract expired in July 1943, but in view of the importance of the work to the Armed Forces the contract was extended and amplified not only to review, evaluate, and make recommendations for improvement of the work already completed but also to devise new procedures for the effective disinfection of water in small quantities

In the course of this further investigation, numerous water purification compounds submitted by various manufacturers were screened It soon became evident that iodine releasing compounds most nearly satisfied the requirements of the Armed Forces Concurrently with these tests the research group succeeded in developing a periodide which seemed more stable than other compounds This periodide is tetraglycine hydroperiodide (formerly considered to be triglycine hydroperiodide) It resulted from reactions between elemental iodine, potassium iodide glycine and hydrochloric acid

A tablet containing tetraglycine hydroperiodide, sodium acid phosphate, and a small amount of talc was compounded The tablet weighed about 120 mg and liberated 8 mg of elemental iodine in 1 quart of water Professor Gordon Fair *(2)* reported that in a pH range up to 7 5 dissociation into iodine is almost complete and the hydrolysis of iodine is not appreciable Iodamines are not formed The action of the elemental iodine probably accounts for its superior germicidal activity in the presence of organic materials Fair further reported that experimental cysticidal times for 7 5 mg of elemental iodine per liter are 5 minutes at 23 C 10 minutes at 10 C , and 20 minutes at 5 C , and that with this dosage and contact periods, *Escherichia coli Eberthella typhosa Shigella dysenteriae Salmonella schottmüllen* and *Vibrio comma* are reduced from 100,000,000 to 5 or less per hundred ml of water The cercariae of schistosomes are killed by a somewhat lower iodine content *Leptospira icterohaemorrhagiae* succumbs at an even lower iodine content or in a shorter exposure time The virus of infectious hepatitis has not yet been tested against iodine Comparative results on the destruction of the virus of poliomyelitis by halazone and an iodine releasing compound promise substantially parallel behavior of iodine in the destruction of viruses that have been killed by chlorine

The course of the investigation now appeared to demonstrate that an iodine releasing compound for individual water purifica

(2) F r G M W d f nd lted b I Andrus E C Br k D W Ca d G A Jr K f C S Lo kwood J S W J T nd W M C (d or) Advanc M l tary Med Li l Br w & Co Bo Ma 1948 V l II, hap 34 pp 520-531

tion was available which would destroy amebic cysts, bacteria, and cercariae of schistosomes within 10 minutes in most waters, and within 20 minutes in cold water It was suspected, however, that under climatic conditions of high temperature and humidity, the prolonged ingestion of iodine might cause the body to become more susceptible to fungus infection or to develop manifestations of chronic iodism Therefore, tests were conducted using small groups of men under artificial tropical conditions in hot chambers Although toxic symptoms did not appear in these test groups, it was considered that because of the limited number of subjects and short duration of exposure to iodine the results were inconclusive

It was decided, prior to the standardization of the iodine tablet, to conduct an extended field test on a group of people in an area of constant high temperature and humidity where all the water consumed would contain iodine

After many test sites were investigated, a naval installation at Uliga Island, Majuro Atoll (Marshall Islands), was selected Basically, the test consisted of the introduction into the chlorinated water system of enough soluble iodine compound to yield iodine concentrations equivalent to, or in excess of, those used in the field purification process This was continued over a period of 6 months, during which the test subjects were under continuous observation Detailed control data were collected from Coast Guard personnel on nearby Ronguron Island, about 22 miles distant, who drank only chlorinated water Tetraglycine hydroperiodide itself was not introduced into the water supply because of high costs and because its low solubility would not permit the desired concentration with conventional feeding equipment Sodium iodide was finally selected as the most suitable of the available iodine compounds The test was not concerned with the germicidal efficiency of iodine per se because disinfection was accomplished with chlorine The principal objective was to discover possible toxic effects of iodine consumed over a period of several months under conditions of high temperature and humidity

At the test site the water supply is obtained from rainfall collected in a shallow concrete catchment basin measuring 200 by 300 feet and 4 inches deep Flowing into a sump, the water is chlorinated and then pumped either into the distribution system or into elevated and ground storage tanks The consumption of fresh water varied from 7,500 to 10,000 gallons daily Standard hypochlorinating pumps were installed on the discharge line from the pump station for the purpose of introducing sodium iodide into the water supply in measured quantities The entire water system of the naval station was chlorinated and treated

with iodine during the 6 month period from 1 November 1949 to 30 April 1950 Detailed objective and subjective clinical data were obtained from a group of 24 station personnel Examinations and tests were carried out to detect possible injurious effects such as stimulation or depression of the thyroid, cardiovascular damage depression of bone marrow, renal irritation, sensitization to iodine predisposition to diseases of the skin, and impaired wound healing An effort was made to evaluate the acceptability of the water among those who consumed it

The *results* of this study of subjects consuming iodated chlorinated water over a period of months can be summarized as follows

1 For the first 16 weeks of this study the average per man per day dose of iodine was estimated at 12 mg During the last 10 weeks the iodine concentration in the water was increased to provide an average estimated dose of 19 2 mg per man per day

2 The unique taste of the iodine treated water was at first objectionable to most of the personnel but after a period of exposure, only a few still found the taste offensive

3 The average values derived from serial clinical tests over the 6-month period were compared with (a) conventionally accepted normal values (b) average values from subjects consuming only chlorine treated water and (c) each other to detect any significant pathologic trends Symptoms signs and laboratory findings indicative of disease were searched for in individual subjects

4 Analysis of all of the data did not reveal evidence of weight loss failure of vision cardiovascular damage altered thyroid activity anemia, bone marrow depression or renal irritation among the personnel consuming the iodated water

5 In the opinion of the investigators consumption of iodated water over the 6-month period did not result in an unusual incidence of any form of skin disease There was no evidence of sensitization to iodine among the healthy station personnel under observation nor was there any indication of impaired wound healing or defective resolution of infections as a result of the consumption of iodated water

UNUSUAL COMPLICATIONS OF TROCAR CYSTOSTOMY

ANTHONY A BORSKI *Captain MC USA (1)*

JAMES C. KIMBROUGH *Colonel MC USA (1)*

THE use of a trocar for suprapubic drainage of the bladder was described in 1914 by Lower *(2)* who considered it a safe and useful procedure Many types of instrument have since been described but they all fall into two categories, namely, the trocar, and the trocoscope type which permits visualization of the bladder prior to insertion of the catheter Duffy *(3)* has introduced a trocoscope which permitted visualization of the bladder before insertion of the suprapubic catheter

A trocar cystostomy is indicated for relief of chronic urinary retention resulting from mechanical causes or from neurogenic factors Dougherty *(4)*, however, described the trocar cystostomy as a routine aid for overcoming some of the postoperative difficulties encountered in transurethral resection of the prostate Campbell *(5)* used trocar cystostomy on a 1 day old infant and recommended the introduction of the instrument 2 cm above the upper border of the pubis in a child, and about 4 cm above in an adult

Engel *(6)* reported on 400 patients on whom trocar cystostomy was used In his series there were 9 deaths due to the procedure The average age of the patients in his series was 75 years Only 4 of the deaths were due to technical irregularities, such as a catheter being accidentally pulled out before an adequate sinus was formed In 3 patients, perivesicular extravasation and infection resulted in death Engel also reported that one of his associates inadvertently perforated the bowel of a patient who had had a previous combined abdominoperineal resection for

(1) Walter Reed Army Hospital Washington D C.

(2) Lower W E. Trocar and cannula for suprapubic drainage of bladder U I & Cutan. Rev 18 J 1914

(3) Duffy J J Duffy trocar type J Urol 43 409-416 Feb. 1940

(4) Dougherty J H Ordinary problems met with in electrosurgery of bladder neck and their solution. South M J 44 791 796, Sept. 1951

(5) Campbell M. New flanged trocar for introduction of balloon catheters into cystostomy nephrostomy and pyelostomy J Urol 65 160-162 J 1951

(6) Engel W J Suprapubic trocar cystostomy evaluation and presentation of an improved instrument J U I 65 998 1005 Jun 1951

rectal cancer, but there were no ill effects This is always a potential danger when trocar cystostomy is performed Engel quoted Ferrier as having performed bladder paracentesis on 50 cadavers after the bladder was distended to 500 cc , and in no case was the peritoneum touched. It is hardly necessary to point out that relaxation was perfect in these subjects Austen *(7)* reported 32 trocar cystostomies and listed the following complications

1 A perivesicular abscess on the tenth postoperative day

2 A suspected bowel perforation for which an open cystostomy was performed. No perforation was found at the time of operation

Trocar cystostomy has been carried out at this hospital on about 75 patients over a period of about 2½ years The most common indication was neurogenic bladder Several trocar cystostomies were performed because of acute obstruction, because the patient was considered a poor surgical risk or for diversion of the urinary stream in gynecologic procedures such as the repair of a vesicovaginal fistula. Some of the patients had extensive abdominal injuries caused by gunshot wounds and in some colostomy drainage was present In all of these patients cystostomy was accomplished without difficulty Relaxation in the patients with a neurogenic bladder was excellent and in the others it was variable

The following cases illustrate the possible dangers in performing a trocar cystostomy

CASE REPORTS

Case 1 A 74 year-old man was admitted to the hospital on 10 August 1952 with acute urinary retention of 30 hours duration The patient had severe arteriosclerosis obliterans diabetes mellitus untreated carcinoma of the lip of 2 years duration an old myocardial infarction, and coronary insufficiency Examination revealed the bladder extending up to the umbilicus The prostate was enlarged grade II firm and smooth except for a hard mass 1 cm in diameter in the left apex The median sulcus was shallow and there was no fixation of the gland

The patient s urine was loaded with white and red blood cells, and contained albumin (3 plus) The serum urea nitrogen was 29 4 mg per 100 cc and the urine culture was negative

Immediate decompression of the bladder was begun and continued for several hours On 16 August, after distending the bladder to 600 cc a needle guide was inserted into the bladder at a point about 3 cm superior to the symphysis pubis. The

(7) Aust G. J S p p b troca dr nage f bladd Am. J Surg Ma 1942

needle pierced the balloon of the Foley catheter which permitted the catheter to come out. There was a good flow of urine through the needle guide The trocar was then introduced over the guide and a good flow of urine continued Several hours after the procedure, the patient suffered a slight chill but had no other complaint His temperature rose to 100 4° F

Except for electrocardiographic changes compatible with coronary insufficiency, his condition was satisfactory on the day of operation but on 17 August he complained of abdominal pain Some distention was present and there was an absence of bowel sounds On a regimen of antibiotics, intravenous fluids, and abdominal decompression the patient improved. His urinary drainage was adequate On 18 August his temperature was 98 2° F, and the urinary drainage contained shreds of mucus and debris It was possible to irrigate until clear returns were obtained. The impression of a traumatic rupture of the bowel was confirmed by a cystoscopic examination which revealed the absence of the catheter in the bladder dome

A cystogram disclosed an ileovesicular fistula. An immediate laparatomy was performed and an area of localized fibrinous pentonitis surrounding the traumatic rupture of the bowel was found The perforations were closed and the suprapubic catheter left in place The postoperative course was uneventful The patient received radiation for carcinoma of the lip, but further surgical treatment was deferred because of his severe cardiac damage He was sent home with a cystostomy drainage tube in place

Case 2 A 71 year-old man was admitted to the hospital on 18 August 1952 with symptoms of prostatic obstruction which had been getting progressively worse for 2 years Examination of the prostate disclosed a grade II enlargement, an irregular surface with stony hard nodules, and fixation of the gland The residual urine measured 300 cc. There was 1 unit of acid phosphatase and 3 3 units of alkaline phosphatase. A phenolsulfonphthalein test revealed 40 percent excretion in an hour The urine was loaded with pus cells and a culture revealed *Staphylococcus albus* A roentgenographic survey was negative for metastases A perineal punch biopsy confirmed the diagnosis of carcinoma of the prostate

On 25 August a suprapubic trocar cystostomy, 4 cm above the symphysis was performed under local anesthesia. At that time it was noted that the patient was straining, but the bladder was readily palpable Urine flowed freely through the trocar, indicating that it had been inserted over the needle guide into

the bladder and there was a good flow of urine from the inse catheter

On the following day the patient complained of abdom pain Abdominal distention was present, there were no bo sounds and a small amount of green drainage had gathered aro the catheter A diagnosis of traumatic perforation of the bo was made and a laparotomy performed immediately A thro and through perforation of a loop of the small bowel was fo The catheter was in place with its tip in the bladder Re was carried out and a suprapubic catheter left in place

The postoperative course was uneventful Transurethral section of the prostate was performed on 1 October and castra on 9 October The suprapubic cystostomy tube was remove 11 October and the wound healed satisfactorily The patie urinary stream was adequate and there was no residual u He was discharged on 15 October, and advised to take diet stilbestrol

COMMENTS

In case 1, there was no obvious factor to account for perforation The bladder was sufficiently distended and there minimal straining during insertion of the needle guide In cas the bladder had been collapsed for 7 days by a retention cath and had been insufficiently distended during the trocar cystost Another factor which may contribute to possible complicat was the straining of the patient under local anesthesia and resulting displacement of the small bowel toward the suprap region

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Th 1952 Y ar B k f Orth ped c d Traumat Surg ry (No mb l Nov mb 1952) d t d by *Edw d L C mp* M D F A C Prof or f B e d Jo t S g ry Northw st r U r ty Me Scho l Ch rm D p tm t f Orthoped Surg ry W l y M ll p t l Con lt t Orthoped Surg Ch go M mor l A g d Ill nr t H p tals 388 pag ll t t d Th Y ar Book l h t In Ch go Ill 1953 P $6

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THE RECOGNITION OF METASTASES

WILLIAM C MATOUSEK *Captain MC USA*

IT is interesting to compare the number of metastases recognized clinically with the number found at autopsy Data relative to this point, covering 400 consecutive cases in which the primary cause of death was carcinoma, were obtained from the autopsy protocols of Walter Reed Army Hospital for the period from January 1940 to August 1948 (table 1)

Ten locations were favored by metastases Each of numerous other sites was involved in less than 10 of the 400 cases Metastases to the liver, lungs, bones, brain, and skin were usually recognized clinically On the other hand, metastases to the kidneys, adrenals, pancreas, heart, and spleen were almost always unrecognized until the autopsy It is therefore appropriate to ask whether more exhaustive studies will result in increased recognition of these metastases Such recognition would seem to be particularly important to patients with metastases to the adrenals and the heart because specific therapy of these conditions may greatly improve the patient's lot

Metastases to the adrenals Of the 81 patients with metastasis to the adrenals, the metastases were secondary to carcinoma of the lung in 35 Eight of 55 testicular carcinomas, 7 of 23 pancreatic carcinomas, 6 of 41 gastric carcinomas, and 6 of 15 renal carcinomas metastasized to the adrenals In none of these was adrenal metastasis suspected clinically Classical signs and symptoms of Addison's disease may be evident, but they are usually erroneously attributed to terminal malignancy rather than to the adrenal metastases *(1)* Although it is impractical to employ all of the endocrine, electrolyte, and carbohydrate tolerance studies available to establish a diagnosis of adrenal insufficiency in a patient with a known carcinoma, at least in a patient with bronchogenic carcinoma with metastasis, a 4 hour ACTH test should be made to evaluate adrenal function If a diagnosis of adrenal insufficiency is made, the patient's condition may be greatly improved by treatment with DOCA and cortisone as well

(1) Butterly J M Fishma L Seckl J and Steinberg H Addison's disease secondary to metastatic carcinoma of adrenal glands Ann Int Med 37 930-939 Nov 1952

as electrolyte control A patient with supposedly terminal cancer may thus be converted into an apparently healthy person for many weeks

TABLE 1 *Cl cal and p th l g c nc d c f meta tas s*

S t f met st	Numbe recog ed	
	Cl i lly	At autop y
L r	112	175
L g	149	171
Bo	56	59
Br n	21	36
Sk n	13	13
Kid y	4	59
Ad n l	0	81
P	0	33
H t	0	23
Spl	0	22

Metastases to the heart Of the 23 patients with metastasis to the heart the metastases were secondary to bronchogenic car cinoma in 11 to renal carcinoma in 4 and to testicular car cinoma in 4 In none of these was cardiac metastasis suspected clinically The physician is often not even aware of the cardiac tamponade caused by extensive metastatic growth in the peri cardium or by pericardial effusion Dyspnea and thoracic pain particularly in a patient with bronchogenic carcinoma should suggest this possibility Pericardial involvement may be anticipated before symptoms occur, by roentgenographic and electrocardiographic studies *(2)* Much relief is afforded patients with cardiac tamponade by pericardial aspiration or deep roentgen ray therapy—whichever seems more appropriate in the given patient

(2) F i dbe g C. K. D f he H t W B Saund C Ph lad lphia Pa 1949

AMALGAM FAILURES

ROBERT P MOSS J *Carlisle, PC, USA*

IT becomes evident to every dentist pe forming oral examinations that a large number of amalgam restorations placed in patient s teeth become faulty or fail to function properly In routine examinations these may be classified as defective fillings or possibly new caries The material used may have been unsatisfactory or the previous operator may not have followed the accepted principles of good operative procedures After observing an alarming number of amalgam failures, it was decided that a determination should be made as to why they occurred A number of causative factors were suggested and a plan was adopted to record the failures observed in routine dental examinations

TABLE 1 *Types of failure and causative factors*

Type of failure	Total	Causative factor	Total
Recurrent caries	540	Faulty cavity preparation Failure of material	528 12
Fracture	355	Faulty cavity preparation Traumatic occlusion Faulty manipulation	310 28 17
Dimensional change	51	Expansion Contraction	39 12
Periodontal involvement	33	Lack of anatomic contour	33
Pulp	21	Lack of protective base	21
Total	1 000		1 000

A chart (summarized in table 1) listing the common causative factors, with a space for additional comments by the examiner, was made The patients were Army personnel predominantly in the age group of 19 through 27 years and examinations were made by Army dental officers No record was made of the age of the restoration When a failure was observed, one clear-cut or definite causative factor was selected as the reason and re

as electrolyte control A patient with supposedly terminal cancer may thus be converted into an apparently healthy person for many weeks

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Metastases to the heart Of the 23 patients with metastasis to the heart the metastases were secondary to bronchogenic carcinoma in 11 to renal carcinoma in 4 and to testicular carcinoma in 4 In none of these was cardiac metastasis suspected clinically The physician is often not even aware of the cardiac tamponade caused by extensive metastatic growth in the pericardium or by pericardial effusion Dyspnea and thoracic pain particularly in a patient with bronchogenic carcinoma should suggest this possibility Pericardial involvement may be anticipated before symptoms occur by roentgenographic and electrocardiographic studies *(2)* Much relief is afforded patients with cardiac tamponade by pericardial aspiration or deep roentgen ray therapy—whichever seems more appropriate in the given patient

(2) F dbe g C. K. D f he He t W B Saund C Ph lad lph Pa 1949

THE EHLERS-DANLOS SYNDROME

MELVIN L. SAMUELS *Captain USAF (MC)*
MELVIN L. SCHWARTZ *Captain USAF (MC)*
MORRIS M. MEISTER *First Lieutenant USAF (MC)*

THE Ehlers Danlos syndrome is an unusual condition well known to dermatologists and pediatricians. When fully developed, the diagnosis is clear cut, but many mild forms of this condition are overlooked. Although first described by Ehlers (*1*) in 1901, the first report in the American literature (*2*) appeared 33 years later. The cause is unknown but the hereditary aspects have been clarified by Johnson and Falls (*3*). It appears that the condition is transmitted as a Mendelian dominant trait. This disorder is characterized by (1) hyperextensibility and hyperlaxity of the joints, (2) hyperelasticity and hyperlaxity of the skin, and (3) friability and fragility of the skin with scar formation and hemorrhagic manifestations following minor trauma. Profuse hemorrhage following minor surgical procedures has been reported (*3*) even though the bleeding time was normal. Pseudotumors and subcutaneous nodules have been described as either subcutaneous fat (*4*) or true fibromas (*5*).

The following case report is presented primarily because of the unusual hemorrhagic manifestations.

CASE REPORT

A 32 year old married woman (gravida III, para II) gave a history of "spotting" with 2 previous pregnancies, but both had progressed to term and with normal labors. There were no postpartum complications. Her last menstrual period began on 7 April 1951. The expected date of confinement was 12 January 1952.

The patient appeared older than her stated age. Her features were coarse and her cheek bones high and prominent. Her skin had a velvety feel and over the nape of her neck was thickened

(*1*) Ehlers, E. Cutis Laxa. Neig. gzu. Haemorrhagien in der Haut. Lockerung Mehrer Articulationoen. Dermat. Ztschr. 8: 173, 1901.

(*2*) Tobias, N. Danlos syndrome associated with congenital lipomatosis. Arch. Dermat. & Syph. 30: 540-551, Oct. 1934.

(*3*) Johnson, S. A. M. and Falls, H. F. Ehlers Danlos syndrome; clinical and genetic study. Arch. Dermat. & Syph. 60: 82-105, July 1949.

(*4*) Weber, F. P. and Arkell, J. K. Nature of cutaneous spherules in one case of Ehlers-Danlos syndrome. Lancet 1: 198-199, Jan. 22, 1938.

(*5*) Rosch, se. F. Dermatorhexis with dermatochalasis and arthrochalasis (so-called Ehlers-Danlos syndrome). Am. J. Dis. Child. 51: 1403-1414, June 1936.

and furrowed Her uterus was enlarged to the size of a 3-month gestation The blood was group O, Rh_0 positive, with 4,330 000 erythrocytes and a hemoglobin of 13 5 grams Iron, calcium, and vitamins were prescribed

The prenatal course was uneventful until the seventh month of pregnancy when scattered petechias on the upper extremities were noted by the patient At that time the Rumpel Leede phenomenon was markedly positive bleeding time was 4 minutes coagulation time (capillary tube method), 2 minutes platelet count 346 000 and prothrombin time, 100 percent Twenty mg of rutin and 100 mg of ascorbic acid were given daily by mouth, but the petechias continued to appear throughout the remainder of the pregnancy

On 14 January 1952 an apparently normal living infant was delivered spontaneously after 4 hours of labor The placenta was circumvallate in type and contained several moderate sized healed infarcts Blood loss during delivery was estimated at 100 cc During an uneventful postpartum course, she was given intramuscularly 25 mg of testosterone proprionate daily for 5 days and 0 2 mg of ergonovine maleate by mouth t i d for 4 days Postpartum vaginal bleeding was not excessive, and blood studies on discharge showed a hemoglobin of 13 grams with 4 100 000 erythrocytes

On 18 February the patient reported for a postpartum check complaining of vaginal bleeding since discharge from the hospital On examination the uterus was 2½ times normal size and was bleeding excessively Dilation and curettage was performed 3 days later in the belief that some retained placental tissue was the cause of the bleeding The pathologic report disclosed only a moderate amount of secretory endometrium She was discharged from the hospital on 25 February with minimal vaginal bleeding She returned 1 month later complaining of continued vaginal bleeding Her uterus was of normal size but blood was oozing from the cervix She was readmitted and on questioning it was learned that she had had recent mild epistaxis on forcefully blowing her nose occasional rectal bleeding on bowel movement since she was 18 years old excessive bleeding following tonsillectomy at the age of 14 years, and that for many years she had bruised easily Double jointedness especially involving her fingers and hip joints, had been present since early childhood Joint subluxation was not sufficient to impair normal activity Traction on the skin over her cheek bones knees and elbows produced a mild tenting effect (fig 1) On release of the tension, the skin returned to its normal position On this admission her bleeding time was 4 minutes coagulation time (Lee-White) 5-7½ 8 minutes platelet count 260 000 clot retraction

normal, prothrombin time, 100 percent, urine and stool, negative for blood, bone marrow examination, mild erythroid hyperplasis, 17 ketosteroids, 18 mg per 24 hours (normal 10-29), and Thorn test normal

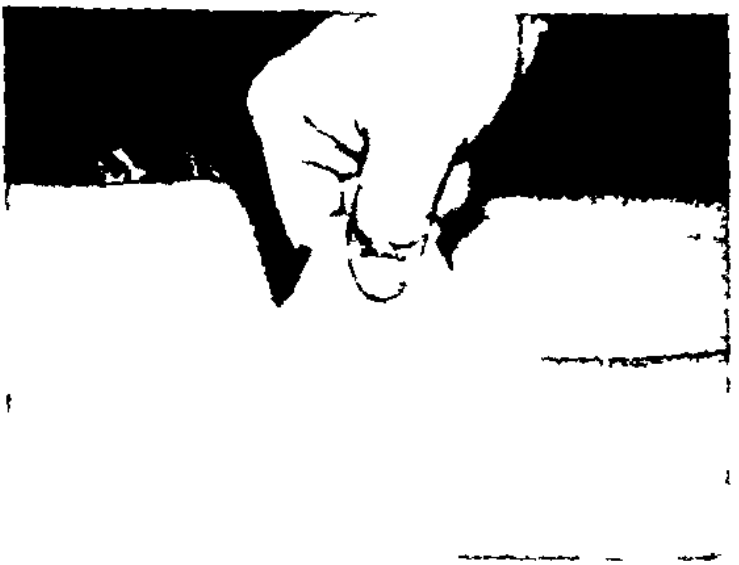


Figure 1 Photograph showing the hyperlaxity of the skin

A tentative diagnosis of Ehlers Danlos syndrome was made This was supported by the findings of atrophy of the epidermis with blunting of the rete pegs, increase and fragmentation of elastic tissue, and basophilic degeneration of the collagen in the upper corium (fig 2) We were unable to follow the patient beyond this point because of her return to the United States

DISCUSSION

Although the Ehlers Danlos syndrome has been described as primarily a skin disease, this case illustrates that altered capillary fragility and resultant hemorrhagic manifestations may accompany it (as would be expected of a disorder classified as a constitutional mesenchymal dyscrasia) *(6)* Tissue studies of organs have not been made, but Ormsby and Tobin *(7)* have assumed that the elastic tissue disturbances may not be limited to the skin The increase in defective elastic tissue along with a diminution in collagen may be primarily responsible for the increased capillary fragility That the elastic fibers play an important role in capillary fragility has been demonstrated in histologic study of petechias produced in normal persons by negative pressure technics Fragmentation of the elastic tissue ele-

(6) Benjamin B (Maurice I), and Weiner H Syndrome of cutaneous fragility and hyperelasticity and articular hyperlaxity Am J Dis Child 65 247 257 Feb 1943

(7) Ormsby O S and Tobin W W Cutis hyperelastica case report Arch Dermat & Syph. 38 828-829 1938.



Figure 2 Photomicrograph showing atrophy of the epidermis with blunting



of the rete pegs and the increase and fragmentation of elastic tissue X 126.

ments in the skin contiguous to the hemorrhage has occurred with no damage to the endothelium *(8)* the erythrocytes escaping by diapedesis Hyperelasticity and fragility of the skin have been thought to be due more to the qualitative changes in collagen *(9)* than to quantitative changes in elastic tissue

The normal bleeding time in this syndrome is explained by the retraction of the wound edges due to the increased elastic tissue which results in compression of the capillaries Hemorrhagic manifestations, if they occur, are thus not usually severe The spontaneous occurrence of petechias during the seventh month of pregnancy is an unusual manifestation and may have been related to the expanded blood volume which reaches a maximum at this time

Differential diagnosis should include pseudohemophilia hereditary familial purpura and hereditary hemorrhagic telangiectasia There is no specific treatment for this syndrome other than prompt recognition and prevention of undue trauma Wounds should be promptly sutured and compression applied to hematomas in order to minimize the exaggerated tendency for scar formation with deformity *(7)* Orthopedic appliances and operations *(10)* may be necessary in the treatment of extreme articular hyperlaxity

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(8) H F W J d M ll A J Cap ll y t Ar h De m & Syph 64 449-463 Oct 1951

(9) Gadrat J d Ba A Sur l yndr m d Ehl D l A d De m Syph 78 430-444 J ly A g 1951

(10) T ylor F R Me kr Ehl D l yndr me Ur l & Cut R 47 378-379 Jun 1943

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Ocular Th rape t by *W ll m J H rr on,* M D Phar D F A C. S., Att nd g Surg W ll Ey H p t l C lt g Ophthalmolog Penn ylvania R lroad A iat Prof in Ophthalm l gy Jeff r on Med l Colleg Ph l d lph P 2d ed t on 282 pages Charle C Th ma Publ h r Spr gf ld Ill 1953

REPLACEMENT LIPOMATOSIS RESEMBLING RENAL TUMOR

JOHN T CANGELOSI *Commander MC, USN (1)*

THE following case is reported because of the difficulty encountered in distinguishing renal lipomatosis from a renal tumor, both grossly and microscopically, following renal resection for infected multilocular cysts

CASE REPORT

A 22 year-old Marine was admitted to another hospital on 12 May 1952 because of a dull ache in the left flank and back and urinary frequency and burning There was tenderness in his left costovertebral angle, pyuria, and albuminuria He was given penicillin for 7 days with symptomatic relief Intravenous urography was not done because of feared sensitivity to contrast medium Cystoscopic studies were incomplete because of obstruction encountered by ureteral catheters bilaterally resulting in unsatisfactory pyelograms On 23 May he was transferred to this hospital with the sole complaint of a dull ache in the left costovertebral angle Many leukocytes were seen in the centrifuged urinary sediment Urine concentration and dilution tests were within normal limits

A roentgenogram of the urinary tract revealed a large mass in the lower left renal region Both intravenous and retrograde pyelograms revealed distortion of the left renal collecting system, apparently caused by pressure from a cystlike mass in the lower portion of the left kidney Hydro-ureter was seen on the left These findings were interpreted as cyst or tumor of the left kidney The right renal shadow was slightly smaller than normal and there was an irregular deformity of the collecting system such as is seen in a developmental anomaly (figs 1 and 2) The right ureteropelvic junction was narrowed, just admitting a No 4 French ureteral catheter Function tests of both kidneys, using intravenous pyelography and indigo-carmine excretion, were normal

Surgical exposure of the left kidney revealed a large cystic lower pole from which about 100 cc of clear yellow fluid was

(1) U S Naval Hospital Charleston S C time of writing now at U S Naval Hospital Philadelphia Pa

Figure 1 R rograd pyel gr m bowl g dil ta ion l le/t enal pel l aus d by a cy lic bowe pol gram bowl g cy t of le/ kidney wi h dil or lo / ight renal pel is

Figure 2 R grad pyelo

aspirated by needle Directly under the first cyst wall was an other, from which about 200 cc of thin, white pus was aspirated When these 2 cysts were collapsed, a third, smaller than the first 2, was seen near the hilar portion Aspiration again produced a thin, white pus This multilocular, infected, cystic mass was resected from the main body of the kidney, which on inspection appeared to be smooth, normal renal parenchyma In the cyst wall near the renal hilum was seen a round yellow white, solid tumor measuring about 3 cm in diameter and grossly resembling a renal carcinoma Nephrectomy was not carried out because of the doubtful status of the right kidney

The pathologist reported multilocular cysts of the lower pole of the left kidney Vascular granulation tissue lined the cyst walls The outer wall was composed of compressed atrophic renal parenchyma in which microscopic cystic tubules, atrophic cellular glomeruli with wide glomerular spaces, thickened arteries bundles of smooth muscle, collections of lymphocytes, and a diffuse scattering of lymphocytes, eosinophils and polymorphonucleocytes were seen Focal collections of polymorphonucleocytes and micro-abscesses were noted perivascularly Lymph follicles with active centers showing phagocytosis were seen Sections through the opaque, yellow tumor and the large cyst wall showed compression of the kidney parenchyma to form a pseudocapsule that was heavily infiltrated by lymphocytes, plasma cells, and eosinophils This pseudocapsule was edematous and vascular, and merging into it were nests of clear cells sometimes arranged in strands, showing a clear foamy, granular to vacuolated cytoplasm around a central nucleus The cells were polyhedral and uniform Many areas of necrosis and hemorrhage were present Clear cells were arranged in cords on thin fibrovascular strands merging into adjacent compressed atrophic renal parenchyma

No growth from the pus obtained at operation was observed on blood agar or MacConkey s medium The patient had had penicillin prior to hospitalization

DISCUSSION

The diagnosis of left renal malignancy (clear cell carcinoma) led to a consideration of total removal of the left kidney This was not done immediately because of the questionable health of the right kidney The function of the right kidney appeared adequate as a result of tests, but the distortion of the collecting system with narrowing of the ureteropelvic junction in addition to apparent shrinking of the renal outline prompted resection instead of total nephrectomy Review of the tissue sections, after the diagnosis of clear cell carcinoma was made, led to revision of the original diagnosis

of the stools changed to yellow but they remained watery and mixed with mucus Tenesmus and cramping continued. There was no anorexia, nausea, or vomiting



Figure 1 Reproduction made from a photograph taken shortly after the rupture of the umbilical hernia. The inset is a photograph of the area of rupture showing the necrotic skin and eviscerated omentum.

On admission the patient was emaciated dehydrated and appeared 20 years older than his stated age His abdomen was markedly distended and exhibited a definite fluid wave when percussed No intra abdominal viscera or masses could be palpated because of the ascites An umbilical hernia was present. The skin over the hernia was dark in color, but not gangrenous There were several well healed scars in both lower abdominal quadrants indicative of previous paracenteses Rectal examination revealed moderate prolapse of internal hemorrhoids. There was no evidence of fresh or old blood on the examining finger There was a 1 plus pretibial pitting edema The white blood cell count was 11 050 with 65 percent polymorphonuclear cytes, 27 percent lymphocytes 5 percent band forms and 3 percent eosinophils The red blood cell count was 2 940 000 with 8 6 grams of hemoglobin per 100 ml The total protein was 6 grams with a 1 1 albumin globulin ratio The serum sodium

was 300 mg per 100 ml. The blood volume was within normal limits.

The patient was treated symptomatically for his diarrhea which subsided on the third day after admission. During this time he also received 1,500 cc. of whole blood. His red blood cell count was raised to 3,500,000 and his hemoglobin to 10.5 grams per 100 ml.

On the night of 20 October the patient, tiring of his umbilical hernia support, removed the elastic binder and arose from his bed to walk to the bathroom, whereupon the umbilical hernia ruptured spontaneously, and there was a sudden profuse emission of ascitic fluid. The loss was estimated to be between 3 and 4 liters. Together with this tremendous loss of fluid, there was an evisceration of omentum. When examined shortly after this occurrence the patient was lying quietly in bed, not in shock, and not in any particular distress. His abdomen was flat and flaccid. In the center of the abdomen there was an omental tag measuring about 8 by 6 by 2 cm. surrounded by the necrotic, thin, ruptured skin of the umbilical hernia. The generally debilitated state of the patient and the character of the ruptured hernia is illustrated in figure 1.

The patient was taken to the operating room where, under local anesthesia, the ruptured sac was explored. Although examination of the omental tag revealed no evidence of impairment of circulation, the neck of the hernial sac was constricted and measured only 1.5 cm. in diameter. The base of the herniated omental tag was firmly adherent to the neck of the sac by dense scar tissue, making it apparent that the omental tag had resided in the hernial sac for an appreciable time. An attempt was made to replace the omentum in the abdominal cavity but because of the dense scarring adhesions, and tendency of the tissues to bleed on handling, it was decided to excise the omentum which had herniated through the neck of the sac. This was doubly ligated with No. 00 chromic catgut flush with the anterior rectus sheath and amputated as illustrated in figure 2. Following this maneuver, 200 000 units of aqueous penicillin G and 0.5 gram streptomycin mixed in 10 cc. of sterile water were instilled into the peritoneal cavity. The rectus sheath was then imbricated over the hernial defect and omental stump using eight 0.003-inch stainless steel wire vertical mattress sutures placed longitudinally along the linea alba in the manner indicated in figure 3. Having repaired the hernia in that fashion the excess redundant, and necrotic skin was excised and a primary closure was made over a small soft rubber drain. A sterile dry dressing was applied using a scultetus binder reinforced with adhesive tape.

The patient had an uneventful and uncomplicated postoperative course insofar as his hernial repair was concerned On 30 December he succumbed, however to the systemic disease which led to his admission

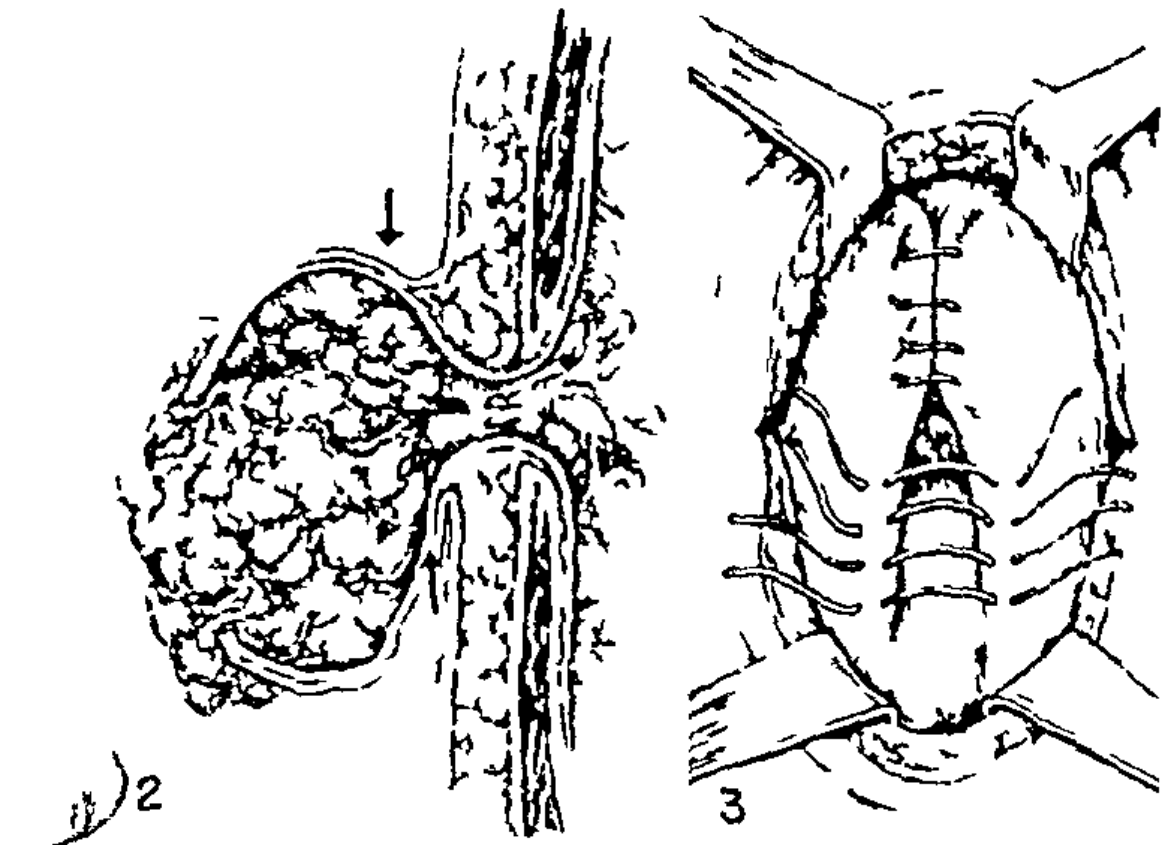


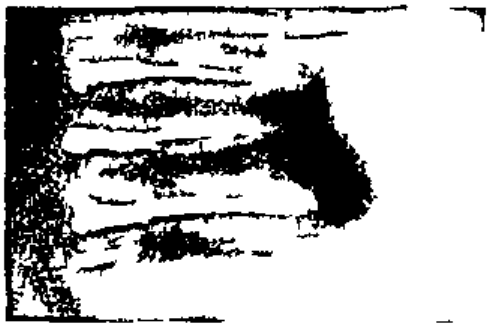
Figure 2 The dott d l ne indicate the line of amputation of the omental tag The arrow po nt to the l ne of xcis on of nec otic ti coveri g the hernia Figure 3 E ght sta l ss st el wi e sutur we used to imbricate the ct beath ove the he ial d' fect

DISCUSSION

It is interesting to speculate on the probable causes of gangrene and necrosis of the skin and eventual rupture of this hernia The e might have been (1) pressure from without caused by the abdominal binder (2) tremendous pressure from within due to the ascitic fluid (3) venous congestion (caput medusae) (4) malnutrition and (5) sudden increase in pressure on the unsupported abdominal wall exerted when the patient arose from a recumbent to a standing position



Figure 4



Figur 3



Fig 2



Figure 1

decided to attempt an all inclusive treatment in one visit to maintain the teeth while eliminating the cyst and to include root canal therapy to the 3 teeth.

The use of a potent and prolonged anesthetic was necessitated by the extensiveness of the lesion and the lengthy treatment. The anesthetic of choice was lidocaine with 1:50,000 epinephrine. Right and left inferior alveolar injections were given along with infiltration in the area of the labial frenum to anesthetize the interstitial nerve fibers

The 3 teeth were isolated and lingual openings were made directly into the pulp chambers, giving ready access to the canals There was an immediate release of thick pus from the left lateral incisor The left central incisor was partially necrotic and the pulp was readily removed. Pressure anesthesia with a procaine pellet was required to facilitate the painless extirpation of the pulp of the right central incisor. After properly reaming and filing all 3 canals, they were washed of their debris with 3 percent hydrogen peroxide administered in a Luer Lok syringe and then rinsed again with chloramine-T solution. The left lateral incisor was aspirated by means of the insertion into the canal of a hypodermic needle attached to an aspirator tube After drying the canals thoroughly with sterile, absorbent points, gutta-percha points were measured to fit into the apexes and then x-rayed to confirm their position The canals were then carefully filled with gutta percha and chloropercha Additional roentgenograms were taken (fig 2) to insure an exact fit at the apexes Finally, the lingual openings were based with cement and filled with amalgam

The anatomy of this mandible was somewhat anomalous, in that it had a heavy, bulbous gingival layer of alveolar bone and a deep concavity in the bone in its approach to the inferior border of the mandible, indicating a lingual version of the roots This, in effect, guided the modus operandi

A large, convex, semilunar, mucoperiosteal flap was made from the distal surface of the right lateral incisor to the distal surface of the left cuspid exposing the alveolar plate overlying the cystic area A window was made through the bony plate by first using a chisel and then enlarging the opening with bone rongeurs This process was continued until sound bone was reached, and the window was large enough to permit proper enucleation of the cyst The cyst was shelled out with a large bowled curet The cystic fluid was yellow and serous The alveolar process was smoothed The cavity was irrigated with normal saline solution and carefully examined Care must be taken to eliminate the entire epithelium because any remnants could proliferate and

produce a residual cyst A cross-cut fissure bur was used to remove the apical third of the devitalized teeth The root ends were rounded and the gutta percha canal fillings were smoothed by the application of a heated instrument Gelfoam was placed in the cavity and the flap was sutured in position The patient was given codeine sulfate tablets for postoperative relief of pain and was x rayed (fig 3) to check the entire operative area An intramuscular injection of 600 000 units of procaine penicillin was administered

Healing was uneventful One month after the operation the in cised area had returned to a normal healthy condition A roent genogram taken at that time (fig 4) revealed filling in of the bone in this area The teeth adjacent to the operative area had retained normal vitality



Figur 5



Figure 6.

Case 2 A 21 year-old man complained of pain in the lower anterior teeth He had received a blow to this region about 9 months earlier at which time he had noted a sensitivity on oc cluding the teeth This discomfort was short lived and dental treatment was not sought Clinical examination revealed a muco-periosteal swelling in the region of the lower central incisors The teeth were tender to percussion Normal incisal abrasion was present The teeth were not discolored The occlusion was good and an otherwise healthy oral condition prevailed Vitality tests revealed that both central incisors were nonvital, but the left lateral incisor and the right lateral incisor reacted normally

A roentgenogram (fig 5) showed a large traumatic cyst located directly below the central incisors It was decided to attempt an all inclusive treatment such as was applied in case 1 The patient was given an intramuscular injection of 300 000 units of procaine penicillin because of the cellulitis and was advised to return in 24 hours at which time right and left inferior alveolar injections were given and the area of the labial frenum was infiltrated to

anesthetize the interstitial fibers The central incisors were isolated and lingual openings made Thick pus was aspirated from both canals The procedure of reaming and filing, washing and sterilizing, and finally drying the canals was accomplished The canals were measured for gutta percha points, x rayed, and subsequently filled carefully After properly filling the lingual openings, the patient was prepared for the next stage

Because of the mucoperiosteal swelling and the normal anatomy of the mandible, it was decided that a flap type of incision was indicated A 45 incision was made from the gingivodistal margin of the left lateral incisor down to the mucolabial fold This was carried labially around the necks of the teeth to the gingivodistal margin of the right lateral incisor and then continued diagonally downward to the mucolabial fold The mucoperiosteum was reflected with a periosteal elevator which completely exposed the overlying osseous structure The osteolytic action of the cyst had caused a complete breakdown of the alveolar bone in the area, clearly exposing the site of infection Bone rongeurs were used to enlarge the openings until sound bone was reached The cyst was enucleated from its bony crypt It extended lingually to the posterior surface of the mandible The cavity was irrigated and examined carefully This cyst contained a thick caseinlike substance, within its epithelial sac The apexes of the involved teeth were cut and rounded, the gutta percha fillings smoothed, and after placing a gelfoam packing in the cavity, the flap was sutured in position An intramuscular injection of 600,000 units of procaine penicillin was given

Healing was uneventful One month after the operation the vitality of the right and left lateral incisors was only slightly lower than on the initial test, the incised area had returned to normal, and a roentgenogram (fig 6) showed filling in of bone in this area

CONCLUSION

The procedure described can be successfully applied to many patients who have a similar type of cyst, thereby saving the affected teeth Postoperative vitality tests and roentgenograms should be taken after 1 , 3 6 , and 12 month intervals until the area has completely healed



Figure 1 Roentge gram of the left ide of the m ndible bow g a f ll cula cyst ci c nscribi g the croun of a impact d third mola uitb a ad oluc t ar a of os e us d truction xt ndi g i to tbe a terior as cend g ram



Figure 2 Occlus l roe tgenogram of the third molar area of the left ide f the mand ble sbowi g the buccal li gual and dist l exte t of the follicula cyst bown i f gure 1



Figure 3 Roe tge gram of the right side of the mand bl bowi g a gre t tba a e ge follicula pace circ m cribi g the crow of the third mola

The treatment of choice is surgical removal of the unerupted tooth with complete enucleation of the cyst wall No portion of the cyst capsule should be allowed to remain because the epithelial cells lining the follicular wall have adamantoblastic potentialities The formation of buds at the basal layer of the epithelium and papillary outgrowth into the lumen are significant danger signs indicating adamantoblastic tendencies *(5)*

CASE REPORT

A 21 year old man presented himself to the dental clinic because of pain and occasional swelling of the left side of his face These symptoms had reoccurred periodically for 18 months He had no palpable submental, submaxillary, preauricular, or cervical lymph nodes He had several carious maxillary and mandibular teeth Both the maxillary and the mandibular third molars were missing There was a slight elevation of the mucosa in the region of the mandibular left third molar

Roentgenograms revealed a mesio-angular, impacted, mandibular, left third molar with a radiolucent area about 2 5 cm in diameter circumscribing the crown (figs 1 and 2) This radiolucent area extended posteriorly into the ascending ramus of the mandible and was suggestive of a central follicular cyst The mandibular right third molar was also impacted in the mesio-angular position with a radiolucent area slightly larger than normal for a follicular sac (fig 3) The maxillary third molars were normal

A provisional diagnosis of impacted, mandibular left third molar with a central follicular cyst was made, and removal of the cyst advised Under 2 percent procaine with epinephrine, a vertical incision was made on the buccal aspect of the first molar The incision was then carried around the cervix of the second molar to its distal aspect The incision was then extended distally about 1½ inches The mucoperiosteal flap was retracted and the wall of the cyst exposed Before proceeding further, a few drops of a yellow cloudy fluid were aspirated from the cyst and sent to the laboratory for smear and culture The bone along the lateral wall of the cyst was parchment thick and was removed with a chisel and rongeur until the cyst capsule was well exposed The dentigerous cyst was then detached as far as possible from its bony crypt The impacted third molar was elevated along with the greater portion of the cyst The remaining tags of the cyst membrane were then carefully and completely enucleated from the mandible The mucoperiosteal flap was replaced and the wound edges closed with black cotton sutures

(5) Shafer R Lecture Syllabus Lettermen General Hospital Sept 1951

The specimen was placed in 10 percent formalin and sent to the laboratory for microscopic examination Healing was uneventful and the sutures were removed on the fifth postoperative day

No organisms were seen on smears of the exudate and there was no growth on culture The pathologist reported that the specimen consisted of a thick fibrous wall lined by patches of noncornified stratified epithelium In the intervening areas there was no apparent epithelial lining and the fibrous tissue lined the cyst wall itself There were many lymphocytes and plasma cells throughout the fibrous tissue The clinical diagnosis was confirmed

DISCUSSION

The roentgenogram of the third molar on the opposite side of the mouth revealed a follicular space which was greater than average for a follicular sac and appeared to be in the formative stage of a follicular cyst though not as advanced as the one removed The differentiation between a large follicular space and a true follicular cyst presents a problem If we had an early roentgenographic criterion which would accomplish this we could remove follicular cysts at an early stage and thereby prevent later widespread osseous destruction Also, because follicular cysts are potential adamantinomas, this differentiation deserves serious consideration

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BOOKS RECEIVED

Bodily Physiology in Mental and Emotional Disorders by *Mark D Altschule* M D Assistant Professor of Medicine Harvard Medical School Boston Director of Internal Medicine and of Research Clinical Physiology McLean Hospital Waverly Virginia Physician Beth Israel Hospital Boston 228 pages Grune & Stratton Inc New York N Y publisher 1953 Price $5 75

Surgery of the Oesophagus by *R. H Franklin*, M B B S F R C S Senior Lecturer and Surgeon Post Graduate Medical School of London Consulting Surgeon King Edward Hospital Lately Professor of Royal College of Surgeons 222 pages Illustrated The Williams & Wilkins Co Baltimore Md publishers 1952 Price $8 50

Laser Injury The Action of the Electric Field on Cells Appendix 1 30 pages May 1952 New York N Y edited by *F W Hoffbauer* M D Associate Professor of Department of Medicine University of Minnesota Minneapolis Minn Sponsored by the *Josiah Macy Jr Foundation* New York N Y Published by Cornell Macy & Co Inc New York N Y 1953 Price $4

THE FAVORABLE RESPONSE OF ATYPICAL HEMOPHILIA TO CALCIUM

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WILLIAM N DONOVAN *Lieutenant Colonel MC, USA (1)*
MARION F BEARD *M. D (2)*

IN the past few years the problems of hemostasis and the hemorrhagic disorders have been extensively investigated New diagnostic tools such as the prothrombin consumption test *(3)* have been devised Some new approaches to therapy, such as use of blood fractions, hormones, and topical anticoagulants, have resulted but much still remains to be learned

We recently encountered a patient in whom the prothrombin consumption test proved to be of diagnostic importance in establishing thromboplastic deficiency as the cause of a bleeding diathesis The appellation of hemophilia calcipriva was considered as possibly applicable to this patient in view of its salient features of hemorrhagic diathesis due to thromboplastin deficiency and an apparent clinical response to calcium Hess *(4)* originally used this title to describe a patient with hemophilia in whom blood calcium levels were below normal In our patient, the blood calcium levels were reported as normal

CASE REPORT

A 24 year old man was admitted to this hospital on 20 June 1952 because of persistent bleeding following a dental extraction performed a week earlier He had been in good health until 12 June when his upper left third molar was extracted Subsequently, he had continued oozing of blood from the alveolar socket despite efforts to control it, including suture, packing with gelfoam, ice packs, et cetera

On questioning as to episodes of bleeding in the past, the patient stated that at the age of 6 years he was struck on the left

(1) U S Army Hospital Fort Knox Ky
(2) Consultant Hematology U S. Army Hospital Fort Knox Ky
(3) Quick A J and Fregly J Prothrombin consumption test clinical and theoretical application Blood 4 1 81 1289 Dec 1949
(4) Hess A F Calcium factor hemophilia case with calcium deficiency Bull J Hopkins Hosp 6 372 1915

evebrow by a rock This caused a hematoma which gradually spread over the left side of his face, down his neck and into his pectoral area, discoloring the entire region In 1945 both his lower third molars were extracted following which he bled steadily over a period of several days At the time however, no special attention was given to the bleeding which spontaneously abated In 1948 he bled from the gums after a dental prophylactic treatment After enduring the bleeding for 4 or 5 days he consulted a physician and was given a calcium preparation by mouth, following which the bleeding stopped Despite this history of bleeding after dental manipulation he denied any tendency to abnormal bleeding on sustaining large cuts or abrasions

His racial background included Scottish, Irish, and English ancestors His parents and 3 siblings were living and well His only brother had no bleeding problems but a first cousin, the son of his maternal aunt and the result of a consanguineous union between first cousins, was a bleeder

On admission he was expectorating small amounts of mixed blood and saliva every few minutes The source of bleeding was identified as the upper left third molar socket which had been closed by suture but from which a steady ooze of blood was seen to issue His blood pressure was 105/75 His nail beds and mucous membranes were of good color No petechias or ecchymoses were seen His liver and spleen were not palpable and there were no enlarged lymph nodes

His bleeding time was 2 minutes 25 seconds clotting time, 5 minutes 10 seconds and prothrombin time 13 3 seconds (control 13 4 seconds) His hemoglobin was 15 grams His erythrocyte count was 5 000,000 His leukocyte count was 9 600 with 58 percent neutrophils 39 percent lymphocytes, and 3 percent monocytes His platelet count was 265 000 One ampule of menadione sodium bisulfite was given parenterally every day His blood calcium was determined on the day following admission and found to be 10 mg per 100 cc

In view of the history of previous response to calcium 10 cc of 10 percent calcium gluconate was given intravenously and continued for several days along with 1 gram of calcium gluconate 3 times daily by mouth On the day following the institution of this treatment the bleeding stopped On that same day the following hematologic data were reported bleeding time 9 minutes (patient and technician thought a small artery had been punctured from the briskness of the bleeding) clotting time (Lee White) 16 minutes partial clot retraction at 1 hour and complete retraction in 3½ hours His hemoglobin was 13 grams His erythrocyte count was 3 900 000 His leukocyte count was 5 300 with 60 per

cent neutrophils, 38 percent lymphocytes, 1 percent monocytes, and 1 percent eosinophils His platelet count was 331,500 Bleed ing and clotting times were repeated twice in the next 3 days, during which time the patient's socket healed uneventfully, but slowly, with no further bleeding These were reported as bleed ing time, 1 minute, clotting time, 2 minutes, and bleeding time, 2 minutes, 50 seconds clotting time, 3 minutes, 30 seconds

The dentists believed that extraction of the opposite (right) upper third molar was indicated and this was permitted while the patient was still receiving calcium On 30 June, the morning of the extraction, the blood calcium was 8 9 mg per 100 cc No

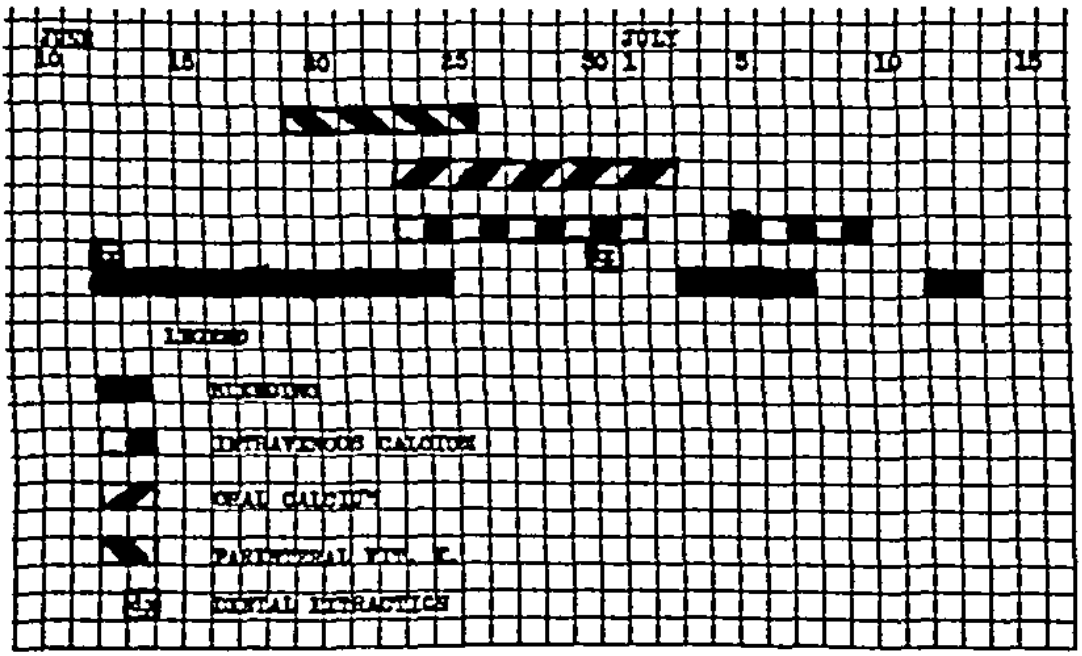


Figure 1 Diagrammatic representation of clinical course and relation to therapeutic measures

immediate bleeding occurred, although bleeding was immediate and continuous after the first extraction on 12 June Calcium was not given parenterally after the first day following this second extraction All calcium was discontinued after the second day Bleeding at the site of this fresh extraction started on the third postoperative day Beginning on the fifth day following the second extraction, 10 cc of 10 percent solution of calcium was given intravenously every day A bleeding time of 2 minutes, 40 seconds and a clotting time (Lee White) of 4 minutes was re ported on this day Bleeding ceased on the eighth day, whereupon the calcium injections were stopped Bleeding did not recur until the twelfth day and lasted 2 days before ceasing spontaneously (fig 1)

In an effort to establish the clinical diagnosis of hemophilia, a prothrombin consumption test was performed on 8 July This was reported as diagnostic The results of the tests performed on 8 and 24 July are shown in table 1 Each test was performed in duplicate Further data obtained on this patient in the interval between these 2 tests were as follows negative tourniquet test blood calcium levels of 11 3 and 12 mg per 100 cc prothrombin time of 14 9 seconds (13 6 second control) total protein of 9 1 grams per 100 cc with albumin 5 5 grams and globulin 3 6 gram (on the same date as the calcium level was reported as 12 mg) bleeding time, 3 minutes clotting time 6 5 minutes partial clot retraction in 1 hour 15 minutes complete clot retrac tion in 4 hours platelet count, 541 800 alkaline phosphatase of 4 units and negative cephalin-cholesterol flocculation and thymol turbidity tests

TABLE 1 *R lts of proth mb onsumpt on te t pr s d s p tbromb time i sec d*

Dat	T st		In bat on t me (m t)			
			1	15	30	45
8 J ly	I	P t t	8	15	15	14
		Contr l	8	15	26	30
	II	P tie	10	12	11 5	11
		Cont l	12	15	29 5	30
24 July	I	P t t	8 5	9	14	14
		Co t l	9	16	28	32
	II	P t t	10	12 5	11 5	11 5
		Control	10	16 5	29	30

Comment Calcium treatment was instituted in this patient largely on the basis of the response of the earlier episode of gingival bleeding The degree of success encountered was not expected in view of the statements in the authoritative texts and articles on the subject *(5 6)* The work of Crano and Sanford *(7)* demonstrated that marked prolongation of the coagulation time appears only when the total calcium is reduced to 2 5 mg per 100 cc Moreover variations in the amount of plasma protein present which might have altered the proportions of ionized to

(5) W tr be M. M. Cl l h ma ogy 3d ed on Le & F b g Ph lad lphia Pa 1951

(6) V le ne W N Diag osis nd manag me of hemor hag disorde M Clin. North Americ 1051 1068, July 1952

(7) Crane M. M. nd Sanford H N Eff of va iat ons in tal cal ium on ra t on pon ong in on ime of blood Am. J Physi l 118 703-707 Apr 1937

nonionized calcium, did not alter this relationship between total calcium and coagulation time It is widely accepted that calcium participates in the coagulation mechanism in its diffusible ionized form, but Stefanini *(8)* has demonstrated an important "calcium labile factor complex" from which calcium must be removed before anticoagulant effects of oxalates or citrates can become evident Conversely, it may be conceivable that such a factor may occasionally be defective Further investigation along these lines might explain such phenomena as occurred in this patient We do not offer any theories or explanations for the effect of calcium in this patient, but simply wish to place on record a description of a clinical experience not predicted by available medical literature

(8) Stefanini M Studies on role of calcium in coagulation of blood Acta med scandinav 136 250-266 1950

BOOK REVIEWS

A Manual of Clinical Allergy by *John M Sheldon* M D Professor of Internal Medicine University of Michigan Medical School Assistant to the Chairman of the Department of Postgraduate Medicine Physician in Charge of University of Michigan Allergy Clinics Director of the Montgomery Allergy Research Laboratory *Robert G Lovell* M D Instructor in Internal Medicine University of Michigan Medical School and *Kenneth P Mathews* M D Assistant Professor of Internal Medicine University of Michigan Medical School 413 pages illustrated W B Saunders Co Philadelphia Pa publishers 1953

This text is prepared, as stated by the authors, for the general practitioner or the specialist in other fields who would like to practice a little allergy and treat the simpler conditions in this field For this purpose, the text is very well designed It covers all the fields superficially, discusses both the accepted and controversial issues and refers to the more extensive texts for the more detailed study It goes into the basic principles of allergy, the antigen antibody reaction, the different phases of immunity, the atopic state, the shock organs usually affected in allergy, the modes of exacerbation of allergic reactions, and differential diagnosis The role of histamine is superficially described There is an excellent chapter on taking the history of an allergic patient and one on the different modes of treatment, including (1) excellent dosage schedules, (2) general instructions regarding dust precautions, (3) eliminating provocative factors, and (4) elimination diets and their variations It has excellent chapters on the preparation of antigens for both testing and treatment Most treat this

part of the subject very briefly Useful charts of the usual offend ing plants and pictures of their pollens for identification are included This is an excellent text for the purpose for which it was written —*Lt Col A J Berger MC USA*

Fundam tals of Cli c l Orth ped by *Pet A C agr nd* M D Orthoped c D p rtment of B ff l Gen r l H pit l B ff l Ch ldr s H p tal and th U i r ity f Buff lo Med cal Scho l Att ding Orthoped t t th Ch ni D s Re ar h I t tut of the U er ty of B ff l d th V t ans Adm str t Ho p t l Buff l N Y and *Harold M. F t J* M D Orthoped c Department f B ff l G l Ho p t l d th U ers ty of B ff l Med c l Sch ol B ff lo N Y Foreword by *Jo pb S B rr* M. D d *F ank N P tt* M D. 582 p ge llustrat d Grun & Str tton I New York N Y publ h r 1953 Pr $18 50

The authors have secured the assistance of a number of addi tional contributors on special subjects to round out this text The book is arranged in 9 sections covering (1) basic science (2) congenital affections (3) affections of collagen synovia and cartilage (4) affections of bone (5) tumors and allied dis orders (6) affections of the nerves muscles, and blood vessels (7) trauma (8) amputations prosthetics braces shoes and shoe corrections and (9) regional orthopedics Diseases are discussed from the standpoint of cause clinical manifestations, and treat ment Surgical procedures are referred to but not described The authors have condensed an enormous amount of information and presented it in a pleasing though superficial manner The illus trations do not adequately cover the large number of entities discussed This book would make an excellent text for the student in medical schools as well as a handy office reference book It provides a ready guide for the advanced student of orthopedic surgery but it might prove slightly disappointing to the advanced student of the specialty —*Col J W Batch MC USA*

Functional N uroanat my by *W nd ll J S Kr g* B S in Med Ph D P f or f An tomy Form ly P f s or of N ur l gy nd Dir tor f th In t t t f N ur l gy Northwester U rs ty Medic l School 2d dit on ed nd gme t d 659 p g illustrat d The Blak ton Co N w York N Y p bl h 1953 P $9

This new edition appearing 11 years after the first includes a large number of "3-dimensional pictures There are many more illustrations of the gross anatomy of the brain than were present in the earlier edition The author also commendably avoids the use of eponyms whenever possible This book is a worthy con tribution to the literature The unique approach to the subject with the frequent use of slice reconstructions should certainly help the student to grasp this difficult subject

—*Commander H S Colony MC USN*

ALLERGIC REACTION TO NIDOXITAL

DOUGLAS F POWERS *Captain, USAF (MC)* (1)

NAUSEA and vomiting are common and annoying symptoms in early pregnancy They are generally believed to be caused by an endocrine imbalance with or without accompanying emotional instability Many types of treatment have given varying degrees of relief Nidoxital (2) is a new preparation which is useful in the treatment of emesis gravidarum It has been used extensively and with excellent results at this hospital Hurlbutt (3) reported very favorable results from its use in a large series of patients

The composition of this drug is as follows benzocaine 100 mg , pyridoxine hydrochloride 50 mg , nicotinamide, 25 mg , dl methionine, 100 mg , and sodium pentobarbital, 15 mg The manufacturers believe that it reduced the response of the esophagus, stomach, and intestine to afferent stimuli, the sensitivity of the vomiting center, and the amplitude of gastric and intestinal muscular contractions and peristalsis The pyridoxine component may improve the ability of the liver and gallbladder to utilize unsaturated fatty acids, and the methionine may provide protection for the liver and improve metabolic function The suggested dosage is 1 or 2 capsules from 30 to 40 minutes before meals, for severe vomiting, 1 capsule may be given every 45 minutes for 3 doses and this dosage repeated in 4 hours, if indicated

Descriptive literature states that the preparation appears to be without toxic reactions even in large doses, and observers (4) have noted the absence of undesirable side effects. No reports of its toxicity have been found This article describes a patient in whom an allergic reaction appeared following the ingestion of nidoxital

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(1) U S Air Force Hospital Keesler Air Force Base Miss At time of writing now at University of Virginia Hospital Charlottesville Va

(2) Product of Orth Pharmaceutical Corp Raritan N J

(3) Hurlbutt F R Use of nidoxital in emesis gravidarum Am J Obst & Gynec 59 458-460, Feb 1950

(4) Personal communication

CASE REPORT

A 28 year old married woman reported that she had not menstruated for 2 months and that in the preceding 2 or 3 weeks she had been severely nauseated and had occasionally vomited in the early morning A diagnosis of pregnancy was made There was a history of nausea and vomiting during the first trimester with each of her 2 previous pregnancies Nidoxital was prescribed and after returning home the patient took a capsule About 1 hour later she was brought back to the clinic by her husband who stated that she suddenly had become ill about 30 minutes after taking the drug She complained of lightheadedness shortness of breath a generalized rash, intense itching of the skin and swelling of all extremities

On examination she appeared apprehensive There was marked urticaria of the entire body particularly of the face and extremities and moderate edema of the extremities There was no history of any previous attacks or of asthma or hay fever in the patient or her family Recovery was prompt after treatment with epinephrine and antihistaminics It was concluded that her symptoms were an allergic response to one or more of the several drugs in nidoxital

DISCUSSION

This report describes the composition and actions of nidoxital in the treatment of nausea and vomiting of pregnancy the generally good results obtained from its use and the usual absence of toxic reactions The case described is significant because it is believed to represent an allergic reaction to this proprietary prescription not previously reported in the literature It emphasizes the importance of a thorough inquiry into possible drug sensitivity in a patient before prescribing a medication

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BOOK RECEIVED

Am b P h l gy Diag is d Chemoth py by *H m lt H And* n M D Pr f s or nd Cha ma Pha ma l gy and Expe me l Ther peut S h l of Medic U er ty f Cal for Med l Cent Sa F is o Calif De f the Med l Γ c lty Ame a U ity of Beu t Beirut Leb 1950-1951 *W re L. Bo t k,* M. D A oc t P fe or f P h l gy Depa tme of P th l gy Sch l of Med c e U ty f Cal for ia M d l Ce ter San Francisc Cal f nd *H b t G j b t* Ph D Prof or f Par it l gy Par tol gy nd My l gy Se t on f the Depa tme t f Medicine Sch l f Med n U ty f Cal for ia Med l Cent r Sa Fra co Cal f 431 page llust t d Cha l C Th mas Publ he Springfield Ill 1953 P $11 50

ISOSPORA INFECTION IN MAN

WILLIAM H WELLS *Lieutenant junior grade MSC USN (1)*

AUGUST J BUCKI *Chief Hospital Corpsman USN (1)*

ABOUT 300 patients with intestinal infection due to isospora have been reported in man since 1915, and of those reported prior to World War II, about 75 percent were from the eastern Mediterranean area During and since World War II, a number of such patients have been reported from other areas Barksdale and Routh *(2)* described 50 cases in Americans stationed in the southwest Pacific, 44 of whom were in the Philippines They were, however, unable to find isospora in examination of stool specimens from 750 Filipinos Meira and Corrêa *(3)* found isospora in 28 persons out of a total of 28 836 stool examinations in Sao Paulo, Brazil, between 1942 and 1950 Of this number, 13 had *Isospora belli* and 15 had *Isospora hominis*

It appears that isospora infections are relatively rare in the temperate regions and few cases have been described from the United States Magath *(4)* found 1 case in 60 000 examinations and Faust *(5)* did not observe a single infection in the examination of 75 000 stools over a period of 16 years Markell *(6)* reported 2 cases

Oocysts of *I belli* (Wenyon, 1923) were observed in a stool specimen received in our laboratory on 24 December 1952, and were demonstrated in repeated specimens received from the patient during the following 18-day period

CASE REPORT

The patient had been stationed in Sao Paulo, Brazil, since July 1950 He departed via ship from Sao Paulo on 19 November 1952 and arrived in New Orleans on 4 December After spending several days in New Orleans, he proceeded to Washington, D C ,

(1) Di si of Par t logy U S Naval Medical School Nat nal Naval Med cal Ce ter Bethe da Md

(2) Ba k dale W L nd R uth C. F I ospora homi is infections mo g Americ pe o nel in uthw st Pacific Am. J Trop Med 28 639-644 Sept 1948.

(3) Meir J A and Cor ê M. O A Isosporos h mana consideracoe s bre 28 ca os R v I st Adolf Lut 10 117-139 1950.

(4) Magath T B Coccidia of ma Am J T p Med 15 91 129 Ma 1935

(5) Craig C F nd F ust E C. Cl cal Parasit logy 5 h ed t on Le a F biger Ph l d lphia P 1951

(6) Markell E K. Inf tion w th Isospora h m t port of 2 c J Par itol 36 500-501 Oct 1950.

arriving about 15 December He was admitted to the hospital for medical observation on 22 December, complaining of diarrhea accompanied by severe abdominal discomfort He had become ill en route from Brazil but attributed his illness solely to motion sickness The diarrhea had persisted however and, at the time of admission he was passing an average of 4 stools a day He was discharged from the hospital on 14 January 1953 his condition greatly improved

Stool examinations Eight stools were examined between 24 December and 13 January All specimens were light yellow and were liquid to semisolid except the last which was brown and partially formed Charcot Leyden crystals were numerous in all specimens Incompletely digested food particles were noted in all and mucus was absent Pus cells were present in large num bers but no blood was noted

Immature oocysts of isospora containing a single unsegmented zygote were observed in direct examination of wet mount prepara tions of the 7 specimens received prior to 13 January Repeated examinations of the final specimen received on that date failed to reveal the parasite

The number of oocysts found was quite constant in direct ex amination of wet-mount preparations of each specimen and aver aged about 1 per coverglass preparation but in the final positive specimen (of 10 January) they averaged 1 per 4 coverglass preparations

Although repeated examinations of all specimens submitted were made, no other parasites (protozoa or helminths) were ob served

Bacteriology of the stool Specimens cultured on 23 and 24 December were negative for enteric pathogens

Hematology Five blood examinations made between 23 Decem ber and 5 January showed a slight increase in eosinophils with counts ranging from 5 to 9 percent 3 of the 5 showing 9 per cent

Description of the oocysts All stool specimens were re ceived soon after passage and in every case only unsegmented oocysts (fig 1) containing a single granular mass were observed at the time of the initial examination The thick walled trans parent cysts varied greatly in size ranging from 25 to 39 9 *microns in length by 10 4 to 19.2 microns in* breadth with an average size of 27 8 by 13 8 microns The oocysts were elongated and in most cases one end was slightly more constricted than the other None showed the pronounced necklike appearance described by some authors as being characteristic of the species

Stools received on 24, 26, and 30 December were kept at a temperature of from 80 to 85 F for several days A large number of oocysts contained 2 sporoblasts at the end of 36 hours (fig 2) and, within 48 hours, most of the cysts had completed their development (fig 3) of 2 oval sporocysts, each containing 4 sporozoites Measurements of the sporocysts gave average dimensions of 13.2 by 8 1 microns

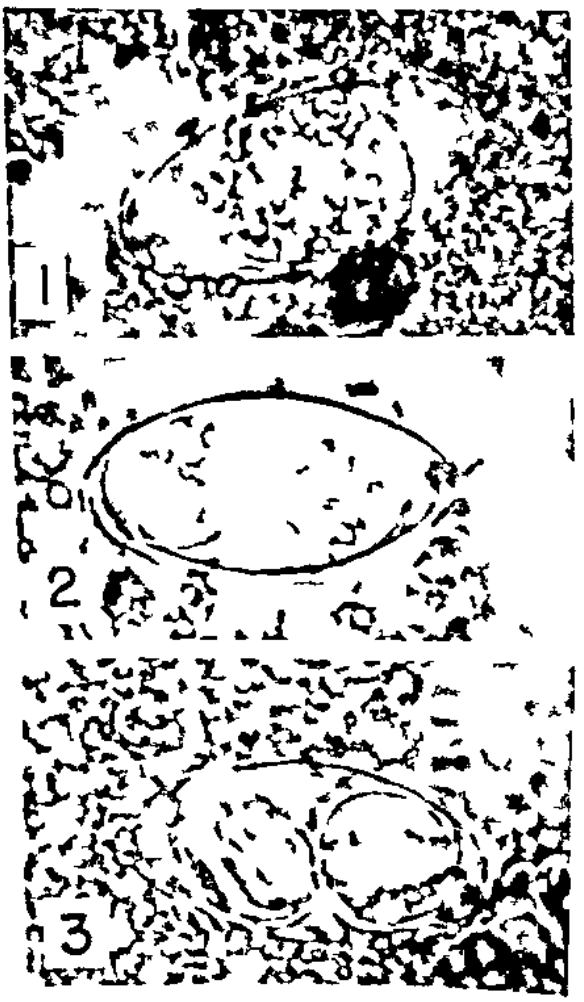


Figure 1 Oocyst from freshly passed feces X 1 00. Figure 2 Mature oocyst with 2 sporoblasts X 1200 Figure 3 Mature oocyst with 2 sporocysts each containing 4 sporozoites X 1.00. (All photomicrographs by W E McLaughlin HMC USN)

DISCUSSION

It is difficult to ascertain where the patient acquired his infection Although a period of 34 days had elapsed from the time of departure for the United States until he was admitted to the hospital we are assuming that the infection was acquired in

Paulo Brazil Matsubayashi and Nozawa (7) reported 2 experimentally infected patients in whom oocysts appeared in the stools 9 and 11 days after infection and were observed in subsequent examinations for more than a month Likewise various authors (2 4 8) believed that with isospora infections the oocysts are not observed until a considerable time has elapsed following the patient s initial complaints Because laboratory examinations both bacteriologic and parasitologic failed to reveal another possible causative agent we believe that the patient s symptoms were probably due to the isospora infection Unfortunately we were unable to obtain stool specimens after the patient was discharged from the hospital

SUMMARY

A case of isospora infection in man is reported in which symptoms were probably due to an infection with *I belli* Although the parasite was first demonstrated in specimens examined after the patient had arrived in the United States, the infection was probably acquired in Brazil

(7) Ma baya h H nd N zaw T Expe me l f t of Isospor h m is ma Am J Tr p Med 28 633 637 Sept 1948
(8) Ma kell E K M ll ng P E nd Schneid D J In t nal para ic f ons naval pe oel Am J T p Med 27 63 65 J 1947

BOOK REVIEW

Hypn a Mod M dic e d t d by J m M. S h ck, M D Cl nic l A oc t s P y hi try College of M d i St t U i ty of N York P y hiatr Con l t W st h ster C unty D partm t of H l h (N Y) Fo nd t nd Pr de t Th Soc ty for Clin l d E pe me t l Hypnosis 323 p g Charl C Thoma P bl h Sp gfield Ill 1953 P $7 50

This book represents the contribution of a group of authors to the present day thinking of those who use hypnosis in their practice Many of the contributors have been trained in psychiatry although those who have not had such training have apparently received rather intensive indoctrination in psychiatric orientation and the technics of hypnosis Because of the number of contributors there is some overlapping and there are some conflicting comments in this book but this is necessary for this type of contribution to present thought The sections on the use of hypnosis in obstetrics and dentistry are especially complete and lucid —*Maj J F Donovan MC USA*

EXTRAVASATED METALLIC MERCURY SIMULATING OSTEOMYELITIS

VICTOR B VARE JR *Lieutenant Colonel MC USA (1)*

SINCE Harris *(2)* first reported a rapid method of intubation of the Miller Abbott tube by the use of metallic mercury in the balloon, complications have been reported following rupture of the balloon with escape of the metallic liquid *(3–6)* In my patient the extravasation of metallic mercury simulated chronic osteomyelitis of the right wing of the ilium

CASE REPORT

A 19 year-old soldier sustained a perforating abdominal wound on 21 September 1950 in Korea After emergency first aid his small bowel perforations were sutured and an ileostomy and cecostomy were performed at a front line surgical hospital Miller-Abbott tube drainage was instituted and passage of the tube was expedited by the use of metallic mercury in the balloon The patient was evacuated through military channels to Hawaii where on 12 October an ileocolostomy was performed While in Hawaii the balloon of the Miller Abbott tube ruptured and metallic mercury was disseminated throughout the terminal ileum, large bowel, peritoneal cavity, and pelvis He arrived at this hospital by transfer on 20 November at which time physical examination revealed a 6 inch healed left paramedian rectus incision In the right lower abdominal quadrant there was a large defect measuring 3 by 3 inches which was granulating and epithelizing from the edges In the center of this area, the cecum ileocecal valve, and about 2 inches of the distal ileum were visible A sinus tract, which when gently probed appeared to extend through the iliac crest was lateral to the granulating area. The discharge

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(1) Valley Forge Army Hospital Phoenixville Pa

(2) Harris F I A new rapid method of intubation with Miller Abbott tube J A M A 125 784 785 July 15 1944

(3) Lindau B W Fecal fistula due to metallic mercury from Miller Abbott tube Report of case J A M A 141 986–987 Dec 3 1949

(4) Hoffman L L Sports on vacuation of metallic mercury from vertiform appendix U S Army M Dept 8 80 803 Oct 1948

(5) Miller T G Personal communication

(6) Vaglini E C Informazioni da pazienti con corpi estranei metallici nel peritoneo e loro conseguenze Med d Lavoro 3 7 15 July 1946

was grossly purulent. Roentgenograms of the abdomen were negative except for the presence of a puddle of pooled mercury at the superior aspect of the right sacro-iliac joint (fig 1) After general supportive therapy a resection of an isolated loop of terminal ileum and right colon was performed on 8 December with a primary wound closure of the fascial defect by means of a pedicle flap The patient made an uneventful recovery from the operative procedure but the sinus over the lateral aspect of



Figure 1 Roe tgc gram showing the depo it of metallic mercury th g on ; the ght ac o-iliac joi t and d struction / th w ng of the l m.

the wing of the ight ilium remained unchanged Culture of the purulent exudate demonstrated *Aerobacter aerogenes* Injection of lipiodol into the sinus subsequently demonstrated ramifying sinus tracts about the bone and communicating with the ex travasated puddle of mercury Barium intestinal studies failed to reveal the presence of an intestinal fistula Roentgenograms of the pelvis revealed deformity of the wing of the right ilium with some sclerotic changes indicative of a chronic osteomyelitis Radical excision after the method of Badgley (7) was performed on 27 March 1951 In the course of the operation, the puddle of metallic mercury was uncovered in the fascial sheaths of the sacrospinalis muscles and the material evacuated Several cultures of the excised sinus tract extending in and about the affected bone gave no growth after 72 hours Primary closure of the wound resulted in healing by first intention and the patient s course was uneventful The only residuum was a mild gluteal gait on the right.

(7) Badgley C. E Os myel of il m A ch Surg 28 83 124 Jan. 1934

Discussion The only source of the metallic mercury was from the Miller-Abbott tube balloon. The puddle accumulated in the subcutaneous soft tissues either through an existing fistula due to the bullet wound or various abdominal operative procedures. Cultures taken at the ostium of the persisting sinus showed *Aerobacter aerogenes* but several cultures of the sinus tracts containing necrotic granulation tissue and communicating with the puddle of mercury taken at the time of operation were sterile. Periosteal reaction resulted in deformity of the bone which grossly simulated a chronic osteomyelitis. Surgical excision of the affected bone and mercurial deposit affected a complete cure. There were no constitutional toxic symptoms or signs. In general it would appear that the use of mercury in the balloon of a Miller Abbott tube should be avoided in any patient with a known wound of the gastrointestinal tract.

BOOK REVIEWS

The Anatomy of the Domestic Animals by *Septimus Sisson*, S. B., V. S., D. V. Sc., Late Professor of Comparative Anatomy in the Ohio State University, Columbus, Ohio; Member of the American Association of Anatomists; Fellow of the American Association for the Advancement of Science. Revised by *James Daniels Grossman*, G. PH. D., V. M. D., Professor of Veterinary Anatomy in the College of Veterinary Medicine, Ohio State University, Columbus, Ohio. 4th edition, revised. 972 pages, illustrated. W. B. Saunders Co., Philadelphia, Pa., publishers. 1953.

This new edition contains sections on osteology, arthrology, myology, splanchnology, the respiratory system, the urogenital system, male genitalia, female genital organs, angiology, neurology, esthesiology, and the chicken in that order. Each of these sections, with the exception of the last-named, contains a detailed description of the concerned anatomic system of the horse. The ox, pig, sheep, and dog, generally speaking, are dealt with comparatively. Some sections contain comparative descriptions of structures in the sheep and others do not. When they do not, the descriptive material pertaining to the cow may or may not carry the parenthetical statement "They are the same in the sheep." A greater consistency in dealing with anatomic systems would have enhanced the book's value.

The principal changes in this edition include a rearrangement of the material that is found in the first part of the section dealing with osteology. Osteologic descriptive terms which were to be found in the previous editions have been placed in the introduction along with other definitions. Thirteen illustrations have been

added Two of these which deal with the stay apparatus of the equine leg are particularly valuable A new feature that contributes to the new edition s general interest is a short biographical sketch and picture of the author The subject matter is clearly and simply presented is well indexed and uses the authoritative terminology of the American Veterinary Medical Association's publication Nomina Anatomica Veterinaria

—Lt Col A H Willers VC USA

E ntials of Body M ch ni s in Health a d Dise e by *J l E G ldbu t,* M D F A C S Ll D Sc D *Lloyd T B w* M D F A C S *L r g T Swa m* M D a d *J b G Kubns* M D F A C S. Sc D 356 p g illustr t d 5th dit J B Lipp ncott Co Ph lad lphia P p bl he 1952

The first portion of this handbook vaguely associates body mechanics with a large group of diseases and disabilities discusses the various body types, and outlines simple descriptions of body mechanics including adaptive changes occurring in adolescence The authors then discuss the relationship of body mechanics to backache the circulatory system abdominal viscera and the nervous system, and the role of posture and mechanics in arthritis There is a chapter on postural exercise with a few general principles regarding braces and the use of plaster Further discussion relates the foot to body mechanics and the role of body mechanics in public health and geriatrics The book is simply written and gives the impression that the correction of faulty body mechanics plays a large role in the prevention and treatment of practically all functional and organic diseases It is difficult to recommend this book as offering any concrete help in the teaching or practice of medicine, or any of its specialties No new concepts in the recognition or management of disease are suggested and all conclusions are vague It might possibly be recommended as casual informative reading for a student of physical medicine *—Lt Col S J Ritchey MC USA*

Conn t J ue Tra ti ns f th Third C f F b uary 14 15 1952 N w York N Y d ted by *Cb l Rag* D pa tme of Medic ne C ll g of Phy s d Surg on C l mb U i ty N w York N Y Spon ed by th *Jo ab M y J F d t n.* 166 p g illustr t d Pr t d by P ogr s As oc at I Caldw ll N J 1952 P c $3 50

This book reflects the opinions of outstanding authorities Technical discussions descriptions of connective tissue staining and a discussion on the fine structure of connective tissues are carefully recorded and illustrated with photomicrographs Clinical implications are stressed the nature of reticulin is described and experimental results with ACTH and cortisone are referred to This book should be of particular interest to pathologists and clinicians *—Col C T Young MC USA*

PLANNING PRINCIPLES OF A MILITARY HOSPITAL SYSTEM

ERNEST T SHEEN *Colonel MSC USA (1)*
ISAAC COGAN *(2)*

THERE is a basic difference in the type and scope of problems and their methods of solution confronting a person on duty in a hospital and one doing staff work in the Office of the Surgeon General The former helps solve many problems, most of them requiring immediate solution, for one hospital while the latter helps solve a few problems, much broader and more lasting in character, for many hospitals The difference in approach and point of view of the field and staff officers stems from the difference in basic problems and each view is quite proper in its place

FUNDAMENTAL CONSIDERATIONS

Basic realities Before the declaration of the limited emergency in 1939, the Army operated 5 general hospitals in the United States On V J Day a total of 65 were functioning with a peak load of over 240,000 patients over 800,000 hospital beds were in operation, world wide, of which 550,000 were in the continental United States It took more than 750,000 Army Medical Service personnel to operate this hospital system With demobilization, the largest hospital system in the history of the world was greatly reduced but since the start of the Korean campaign it has expanded to about 2½ times what it was just before July 1950

The core of all Medical Service planning is the hospital bed requirement, which must be based on the decisions and broader plans of the General Staff and must embody the basic policies and goals of the Medical Service, anticipated desires of the Secretary of Defense, the Director, Bureau of the Budget, and other agencies The planning process of a single problem may take weeks or months to complete When the plan is approved and placed into operation, it becomes the authority for subsequent facility, supply, and personnel planning and actions The latter may involve the expenditure of millions of dollars for materials

(1) Medical Plans and Operations Division Office of The Surgeon General Department of the Army at time of writing now Letterman Army Hospital San Francisco Calif
(2) Chief Resource Analysis Division, Office of The Surgeon General Department of the Army

and services Once the plan is placed in operation, deviations are authorized only when significant changes in the situation justify such action

The Surgeon General s Office must make (1) estimates for normal operations 7 years in advance (2) preliminary budgetary estimates 3 years in advance (3) final budgetary estimates 1 year in advance (4) mobilization plans through M plus 36 (5) operational plans 6 months in advance but subject to daily adjustment and (6) operational authorizations every month in order to meet current situations and requirements

The first step in solving a new problem should be to break it down into many smaller ones A good solution to each small problem means success in solving the main one A wise procedure in solving any problem is to look for a precedent An intelligent evaluation of the past is our only guide for both the immediate and projected situations

National military policies vitally affect hospital planning Table 1 gives the size of the Army hospital system at various periods No records have been found which list the total number of hospitals and hospital beds prior to the Civil War but records of the Revolutionary War indicate that on 2 March 1776 the sick of the Army numbered 2 765 out of a strength of 18 5[0]4 Four general hospitals were established, but it is not known whether they were operating concurrently During the War of 1812 seven general hospitals were established

Shortly after the end of the Spanish American War the President appointed a commission to investigate the conduct of the War Department in the War with Spain Some of the more important medical problems were

1 The Medical Department was neglected because it cost money and because as a noncombatant branch it was considered to be of little importance

2 Two serious mistakes were made by Medical Department personnel They underestimated hospital requirements by using the peacetime rates prevailing for the Regular Army (1 percent in camp infirmaries and 3 5 percent in general hospitals) and they assumed that typhoid fever was carried only by contaminated water

Remedial action taken as a result of this report rapidly improved the quality of Army medical service

TABLE 1 *Size of Army hospital system*

Year	Period	Number of hospitals	Total number of beds	Source of information
1864	Civil War	204	136 894	General hospitals only Union Army
1875	Peacetime	140	2 520	Annual Report Office of the Surgeon General
1899	Spanish American War	Unknown	15 600	Estimated from data in Annual Report Office of the Surgeon General
1916	Peacetime	140	9 530	The Medical Department of the U S Army in the World War Vol V 1923
Nov 1918	World War I	244	397 363	Same (does not include small hospitals)
30 June 1935	Peacetime	129	12 541	Annual Report Office of the Surgeon General
Sept 1945	World War II	952	808 330	Resources Analysis Div Office of the Surgeon General
30 June 1950	Peacetime	81	26 481	Medical Statistics Div Office of the Surgeon General
30 June 1951	Korean campaign	158	72 835	Medical Statistics Div Office of the Surgeon General

*Surgeon General s Office War Department Medical nd Surgical History of the War of the Rebellion Part III Government Printing Office Washington D C 1888, Chap 12

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It is practically impossible to adjust facilities, personnel, and other operating resources of an Army hospital with each fluctuation of the patient load Personnel and fund authorizations are allotted to the Army on a fiscal year basis long before the period of their use Subauthorizations to commands are also made in advance of their use There is usually a lag of from 3 to 6 months between the time that a requirement for personnel or equipment

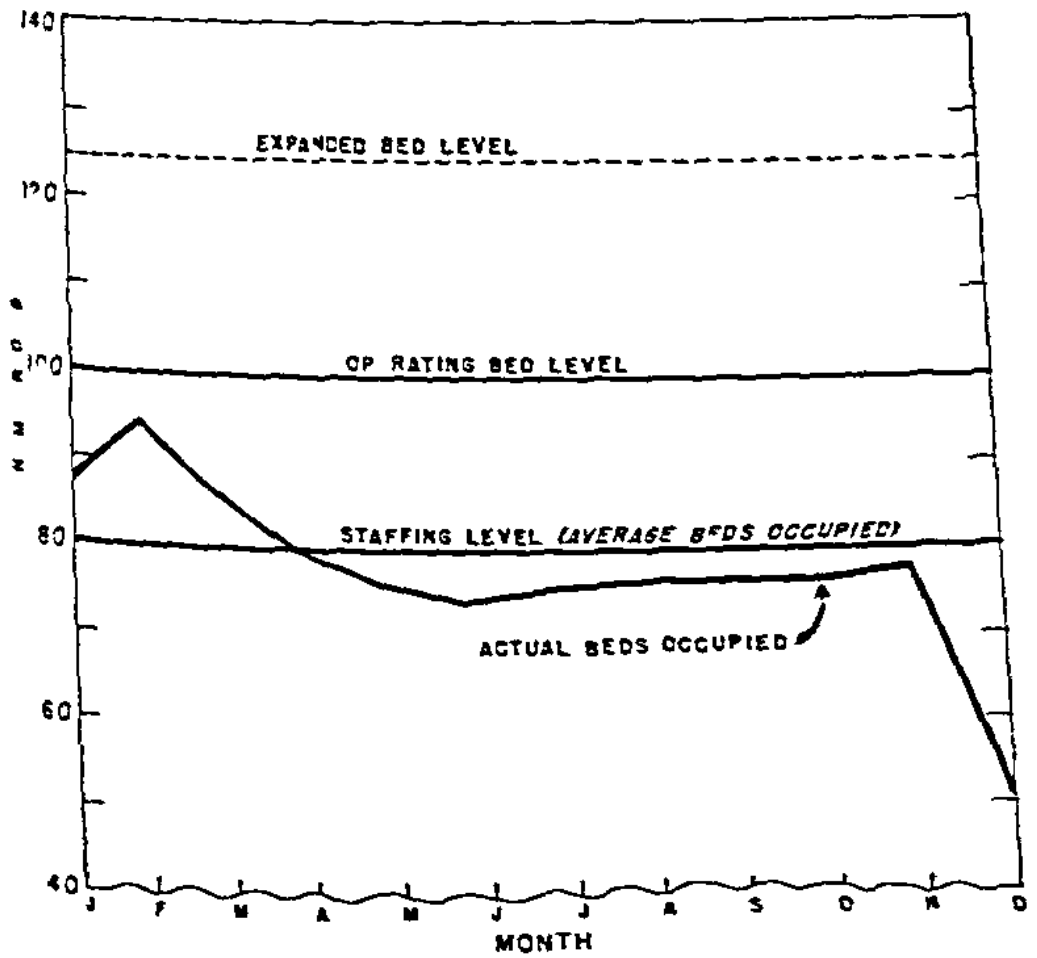


Figure 1

is established and the time the resource is available for use at the hospital It is therefore essential to establish requirements for the various resources used in a hospital at a level which would be fairly constant throughout the year and still permit the absorption of a fluctuating workload In current planning this level (often called staffing level) is the average number of occupied beds anticipated for the year (excluding December because of the high furlough rates in that month). Practically all the resources of a hospital are authorized on this basis even though sometimes expressed in other terms

Staffing guides are often *expressed* in terms of operating beds authorized but they are *calculated* on the basis of occupied beds This is possible because operating beds are established at a

CURRENT FACILITY SUPPLY, AND STAFFING FACTORS

In determining the size of a hospital plant, the current complex plans for construction call for over 700 square feet of floor space per operating bed This includes, in addition to the space required for wards operating rooms clinics laboratories the x-ray service mess halls kitchens offices, storage and recreational space, et cetera The multistoried hospital is the most economical for permanent construction because it requires less land and materials for building The operating costs of the multistoried hospitals are also less than those of a cantonment type of hospital

The hospital admission rate is affected by seasonal fluctuations in the incidence of certain diseases and a hospital must have the capacity to expand to meet these additional requirements This is considered in designing and constructing a hospital by providing 100 square feet of floor space per bed in wards so that, for temporary periods of time, the floor space can be reduced to 70 square feet per bed

A 1,000-bed hospital requires about 440 tons of supplies and equipment before it is ready to receive patients Over 8 000 different items most of which are for hospital use are presently listed in the Armed Services Catalog of Medical Materiel Over 1 900 of these are listed as critical articles in Appendix II of the Munitions Board Requirements Manual Over 500 of these critical items require 9 months or more from the date the purchase order is placed until the article is installed in a hospital and ready for use These include x ray equipment sterilizers, and practically all highly technical equipment

From the modest beginning of the physician and hospital steward a hospital staff today requires over 100 persons per 100 operating beds A hospital staff requires over 200 military occupational specialists among the officer personnel and 75 among the enlisted personnel Civilians also may be included in both categories Many of these people must not only be procured but also must be trained before they can be used effectively

A directive from the Secretary of Defense requires the Army to use occupied beds as the basic unit for personnel requirements and funding The number of beds occupied in the Army hospital system will vary from month to month not only with changes in strength but also with the mission and activity of troops the season of the year, and many other factors These fluctuations are even sharper in individual hospitals Figure 1 shows the average seasonal fluctuation in number of beds occupied for a constant number of Army troops in continental United *States over the last 3 years and the levels at which operation* and staffing of the hospital system is planned

5 To increase military efficiency Our major reason for existence is to increase military efficiency by assuring the physical fitness of inductees, by preventive measures, and by returning patients to duty as quickly as possible

LOCATION OF HOSPITALS

The *categories of patients* are significant factors in planning the location of a hospital For this purpose, military patients on active duty may be divided into those who are expected to return to duty (1) after a short period of hospitalization (from 65 to 70 percent) and (2) after a relatively long period of hospitalization if at all

For the first group, hospitalization should be provided on, or near, the post where a patient is stationed This will facilitate his remaining assigned to his unit and being under its administrative control For morale purposes, a soldier should remain assigned to his unit Patients requiring prolonged hospitalization should be hospitalized as near their homes as possible This reduces the cost of transportation and encourages the visits of friends and relatives If such a patient is to be separated from the service, a saving in the cost of transporting his dependents and his household goods will result Hospitalization of long term patients near their homes is also the desire of the Congress The Surgeon General receives many pleas from members of Congress, state officials, veterans organizations, relatives, and friends for the transfer of a patient to a hospital nearer his home When such requests cannot be granted, the reasons often have to be formally presented to the Secretary of the Army

A patient who will require hospitalization in excess of 90 days is transferred to a medical holding detachment at an early date This permits ordering a replacement to his unit If, on completion of hospitalization, he is to be returned to duty, he gets into the replacement channels of the Adjutant General

Economic considerations Hospitals for patients requiring prolonged hospitalization should be located near large centers of population Most of such patients require highly specialized care which can be adequately provided only by a specialized staff In the interest of efficient use of such resources, it is necessary to concentrate these patients in relatively large hospitals

Based on the above considerations, about two-thirds of the beds in the Army hospital system should be located near troop concentrations and one third near large centers of population This ideal distribution must be modified, however, by the fact that hospitalization for patients in overseas areas who will be in

the hospital for more than 120 days or who are not expected to return to duty, is provided in the continental United States Assuming that about 50 percent of the Army strength is deployed to oversea areas the desirable distribution of beds in the Army hospital system would be one third in oversea areas, one third near troop locations in the United States, and one third near large population centers The Army has, however hundreds of millions of dollars invested in its present hospital facilities This ideal distribution must, therefore, be modified in the interests of economy and the efficient use of already available facilities Furthermore in wartime battle casualties evacuated to the continental United States represent an additional workload for the large specialized treatment hospitals This results in a greater demand for beds in these hospitals

In determining the site for a specialized treatment hospital, the following factors must be considered (1) location with respect to the activities or areas served by the installation and the general distribution of installations of similar type (2) location, communications and accessibility with respect to the principal centers of population (3) the availability of expert civilian consultants to aid in maintaining high standards of professional care (4) logistic problems involved in the transportation of personnel and supplies to and from the installation (5) size of hospital with reference to terrain climate water supply and other physical characteristics (6) feasibility of constructing permanent facilities (7) present state of development and costs of future development (8) economy of operation and maintenance (9) ability of the local community to support the installation with respect to housing for dependents schools, churches retail stores and recreation (10) availability of power and local civilian labor (11) the degree and type of development, and value of real estate in the vicinity (12) civil interest in its later use for nonmilitary purposes (13) impact on the civilian economy in the locality and (14) strategic and tactical considerations

THE SIZE OF THE HOSPITAL SYSTEM

In order to determine the size of the hospital system, it is necessary to begin with the factors which influence the size of a single hospital The operational size of any hospital is primarily related to the number of persons the hospital serves In accordance with the policies of the Department of Defense it may be necessary to include the strength of personnel of the Navy or Air Force in computing bed requirements for an Army hospital A hospital may furnish primary medical care and in addition have a specialized treatment mission This in turn necessitates having strength figures for the area to be served

Beds for facilities are computed on or near estimated peak loads If a post is expected to double its strength in 5 years, any new construction should be large enough to take care of the projected strength Although fluctuations are planned for in computing the patient loads of individual hospitals, different hospitals in the system will reach their peak loads at different times This may create a requirement for more beds in the system as contrasted with the requirements for a single hospital

For many years, planners in the Surgeon General's Office based bed requirements on a ratio to the strength served Currently much weight is given to actual hospitalization experience The latter factor requires consideration of the mission of a command, the deployment of troops, and the military strength The preceding year has been found to be the best time period in applying the experience rates Current hospital operations must be based on short range plans and the preceding year will give an indication of the seasonal incidence of diseases

A hospital is considered full when it is 80 percent occupied This is difficult to explain to anyone not well versed in military medical logistics Because some civilian hospitals operate near maximal capacity, the question is frequently asked Why cannot the Army do so? The few civilian hospitals which operate in this manner can adopt such a policy because they turn away patients when a bed is not available Because active Army personnel must be provided hospitalization when required an Army hospital needs a reserve of beds above the estimated average occupancy Patients are segregated by sex, communicable disease and type of treatment required. An empty bed in a surgical ward is not available for a patient with pneumonia or a psychosis Although volume 6 of the Bulletin of the Hospital Council of Greater New York for June 1950 reported that the municipal hospitals of that area were overcrowded most of the time the average occupancy of the civilian hospitals in the same area was 72 percent as compared with 80 percent currently planned by the Army

The mission of a command The present Army policy is to concentrate troops in large numbers at training installations in the United States A glance at table 1 indicates that the current number of operating hospitals approximates the number in 1875, although the present strength of the Army is several times larger than it was then as is the number of available beds

Commands where basic training is a primary mission have higher hospital admission rates than installations composed of seasoned troops At the former large numbers of recruits are brought together from different localities Those from rural areas are particularly susceptible to childhood diseases These hospitals also admit a large number for physical evaluation

The installation housing seasoned troops may also have special problems, dependent on its mission For example in an airborne division many orthopedic casualties must be expected

A small command may be located away from the main body of troops If other Department of Defense hospital facilities are not available it may be necessary to provide Army hospital facilities for such a command even though it is not economical to do so

In the Far East Command, a mission presently exists that differs from that of other overseas theaters, namely combat activities In addition to the factors determining the size and number of hospitals required for that command the factor of casualty rates enters into the planning requirements Here too experience is a valuable guide Statistics are gathered and carefully analyzed at frequent intervals as an aid in keeping abreast of the hospital problems in the Far East and their effect on the zone of the interior

Because the present policy is to retain the nonvoluntary personnel for 2 years a large number of men become eligible for separation each month They must have physical examinations and evaluation of any disabilities thereby detected

The intensity of training activities is another factor affecting hospital admission rates The tendency to greater realism in training programs has increased the rate of admissions for injuries above the Army average Emphasis on continuous training will necessitate more frequent exposure to inclement weather and other adverse environmental circumstances than if a modification of the daily training program had been adopted This can result in an increase of upper respiratory infections and other diseases aggravated by climatic conditions

Deployment of troops Because of the close contact between members of a military unit it is necessary to hospitalize a man with a relatively minor disease such as German measles to prevent him from transmitting it to the rest of his group In civil life such a man would stay at home and might not even see a doctor during his illness

The diseases endemic in different communities also affect hospital planning

Other Army commitments for hospitalization Although medical service must be provided for military personnel on active duty the federal government also is obligated to provide medical care when facilities are available for dependents of military personnel and retired officers and enlisted men Limitation of facilities normally excludes patients requiring domiciliary care The authority to determine the availability of facilities is delegated

to each medical facility commander Others who are authorized medical service when available include foreign military personnel, civilian employees who are determined to be beneficiaries of the Bureau of Employees Compensation, Department of Labor, and others as specified in AR 40-506

There may also be bed allotments to the Veterans Administration, Public Health Service, and other agencies

THE EVACUATION SYSTEM

The morale of fighting men is adversely affected by the sight of their wounded comrades lying unattended on the battlefield They will stop and give them aid unless there are medical personnel nearby to do so It is highly important, therefore, to evacuate casualties from the front lines at the earliest practicable time

Getting patients to specialized treatment hospitals from forward facilities and returning them to the zone of the interior from overseas commands necessitates the operation of an efficient evacuation system Currently, we transfer patients by air, bus, motor ambulance, rail, and ship Air evacuation effects about 90 percent of current patient movements Although there are few conditions for which air travel is contraindicated, some patients refuse this form of travel Bus, motor, and rail transportation are more economical, especially for short trips Personal reasons, such as a desire to keep a family together, may dictate transfer by ship from overseas

Following the establishment in the Civil War of our present plan of evacuation, World War I saw the development of debarkation hospitals at ports in the United States for the reception of patients returned from overseas They were designed to receive, process, and evacuate large numbers of patients on short notice They received their patients from hospital ships and evacuated them by hospital trains to general hospitals They were used on a large scale in World War II

Air evacuation The first airplane ambulance was developed in 1918 for the Army It was designed to deliver a flight surgeon to the scene of airplane crashes and to evacuate casualties It carried only one patient but proved very valuable Because the acute need for airplanes of all types in World War II precluded the assignment of planes solely for the purpose of patient evacuation, troop carrier and transport planes were used for this purpose as a secondary mission A flight team consisting of one nurse and one technician was organized to provide in flight medical service The need for air evacuation was demonstrated in 1942 during the construction of the Alcan Route in Alaska, the Burma campaign and the early counterattacks begun against

the Japanese in the South Pacific Islands The year 1943 saw the first evacuation over water on a large scale in the North African and Sicilian campaigns The number of patients transported by air steadily increased until the end of the war in Europe in 1945

The full potentialities of casualty evacuation by air were realized in the Leyte and Luzon Pacific campaigns in February 1945 Because of inadequate hospital facilities in Luzon, many of the severely injured patients were evacuated directly from the combat areas Blood and plasma transfusions, oxygen therapy, and shock treatment were given routinely in flight The light transport aircraft was used to great advantage in the forward combat areas under difficult circumstances

A Department of Defense directive dated 7 September 1949, requires evacuation of patients by air in peace or war but surface means of transportation may be used to augment air evacuation

In 1950 the helicopter ambulance proved its value in the evacuation of patients from the forward combat areas in Korea It provides a smooth ride for seriously injured patients and can ascend or descend in a small clearing It has transferred numerous patients from battalion aid stations to the mobile army surgical hospitals within 30 minutes after injury

The advantages of air transportation of patients particularly for long-distance transfers are (1) noneffective personnel can be quickly transported out of the combat areas (2) a patient is transported quickly and easily to a hospital where definitive care can be provided (3) requirements for overseas hospital beds and personnel rations medical supplies hospital ships and other transportation are reduced and (4) debarkation bed requirements in the United States are reduced.

The major disadvantages to air transportation of patients are (1) if an enemy has control of the air there is a chance that the plane may be shot down and (2) inclement weather may delay evacuation although delays from this cause are infrequent

OTHER FACTORS

Shifting requirements During the initial and expansion stages of the mobilization of the Army large numbers of troops are concentrated in the continental United States for training and organization They are served by large posts and specialized treatment hospitals During the early phase of mobilization the bed requirements increase at posts where basic training is given As the troops are trained they move to the division posts with a resulting reduction in the need for beds at the training posts and a concurrent increase in the need for beds at the division posts As the divisions are deployed to overseas areas part of the hospital facilities at division posts become surplus Concurrent

with this oversea deployment of personnel, requirements for beds in specialized treatment hospitals increase because of the increased return of casualties from overseas These additional requirements are met generally by designating the larger station hospitals as specialized treatment centers Although these hospitals are not ideally located in all instances for specialized care and do not necessarily provide a balanced distribution of Army hospital beds according to the population spread, they do have the advantage of being operating units and being available for immediate use When these facilities are designated as specialized treatment centers, they assume the double mission of providing post type hospital support as well as specialized care and treatment

Reserve requirements Because of the sharp and rapid fluctuations in the Army hospital system, we need a reserve of hospital beds to meet epidemics, disasters, and the first stages of mobilization This is an important consideration in the development of hospital plans We should never again make the mistake of being caught without sufficient reserve beds that can be set up for operation on short notice These facilities should be available as part of operating hospitals or inactive hospitals held on a stand by basis In 1950, the Surgeon General was seriously concerned about where the next available bed was going to be found to care for the casualties from Korea This type of need is recognized in current hospital planning and a reserve to meet future contingencies has been included in the plans McCornack Army Hospital, Pasadena, Calif , Rhoads Army Hospital, Utica, N Y , and Birmingham Army Hospital Santa Barbara, Calif , have been returned to Army control as inactive installations under this program It is not anticipated that they will be used except in the event of a major mobilization Action is also in progress to obtain several other Veterans Administration hospitals, which are surplus to their needs, to hold as part of our reserve

Another important feature of our hospital reserve program is the Table of Organization and Equipment hospitals in active service Each hospital has its reserve assignment and readiness date A number of these hospitals have been sent to the Far East since the beginning of the Korean conflict

We have had a hard time explaining to some Governmental agencies why we need reserve hospital beds although no one questions the need for the Ordnance Department to have reserve guns and ammunition or for the Quartermaster Department to have reserve stocks of clothing and tents

Hospital planning for mobilization Mobilization plans are very important In the United States hospital plans are phased

to meet the needs of a mobilizing Army by station Additional specialized treatment hospitals are to become operative in various localities when required In World War II we had over 2 years to build our training camps, division camps, and the supporting station regional convalescent and general hospitals We are not optimistic enough to believe that we will have time to build new ones in the event of the necessity for another full mobiliza tion Many of the hospitals disposed of by the Army after World War II had recapture clauses whereby we could repossess them if necessary They were inspected recently to determine their present condition and the amount of rehabilitation necessary to place them back in operation One of the hospitals that was carried in our plans to become operative 6 months after mobiliza tion was found to have been completely torn down Others were found to have been remodeled to such an extent that it would cost less in time and money to build new ones rather than re convert them back to Army use Some States were using former Army hospitals for tuberculous and mental patients and they could not surrender them until they had time to build or prepare other facilities for these patients As a result of this survey, much valuable data on which to base realistic plans and save time if general mobilization is necessary again was obtained

Miscellaneous Other factors which affect the hospitalization plan are the residency training program and the qualifications of professional personnel assigned to posts The residency training program is the main base on which the standards of professional care and treatment rest and it must be supported This governs the distribution of specialized treatment centers The qualifica tions of hospital staffs on posts affects the evacuation policies and location of hospital beds If adequate medical service is available at a post no medical reason exists for transferring a patient to another hospital Beds for research activities should be assigned in an area where it is convenient to conduct the research

SUMMARY

The operation of the Army hospital system requires careful and continuous study and planning An important new discovery may drastically alter current plans at any time Hospital plans are important factors in the development of plans for facility con struction and rehabilitation procurement and training of Army Medical Service personnel procurement, storage and distribution of supplies and equipment and many other functions of the Army Medical Service They are important factors in the planning of other staff and technical agencies from the Department of the Army down to the smallest post

The objectives in hospital planning are the provision of the highest type of medical care in order to facilitate the return to duty of military noneffectives, and the economical use of facilities, equipment, supplies, and personnel. Because elaborate medical facilities cannot be established at every Army installation, an efficient system of evacuation must be established. The categories of patients, installations to be served, and other economic considerations determine the location of hospitals. Bed requirements must be carefully estimated so that beds will be available when and where they are needed, particularly during mobilization. Reserve beds in operating hospitals or inactive hospitals held on a stand-by basis are needed to meet requirements during seasonal fluctuations of disease, epidemics, disasters, and the first stages of mobilization. Other factors which affect hospital planning are the residency training programs, the qualifications of hospital staffs, and research activities.

In developing a hospital plan for a specific period, an estimate which excludes seasonal fluctuations is first made of the average number of occupied beds. The military strength mission of commands, deployment of troops, the hospitalization rate experience for the preceding year, and other Army hospital commitments must be considered. The number of patients requiring hospitalization at or in the vicinity of posts is estimated for each installation. The number of patients requiring specialized treatment is estimated by specialty in each Army area or large subdivision thereof. The patient loads are then translated into operating bed requirements allowing for segregation of certain categories of patients and seasonal fluctuations. Facilities are designed on a basis of 100 square feet of floor space per bed.

Co-ordination in hospital planning is effected in the Surgeon General's Office with all interested divisions, all interested staff and technical agencies of the Department of the Army, the Armed Forces Medical Policy Council, and (particularly G4) the Armed Forces. Medical directives are co-ordinated and the field. Then implementing directives are co-ordinated and processed through command channels to put the plan into operation.

BOOK REVIEWS

Lillie De lopme t f th Chick A I trod ction t Emb y l gy r t d by *H u d L. H m lt n,* A ociat Pr f sor of Zool gy Th low St t C lleg Am low Ad ory Ed tor *B. H W ll* 3d d t on 624 p g s ill tr t d H nry Holt & Co N w York N Y p bl hers 1952 Pric $8 50

Most chapters of this new edition of a standard text have been expanded and a new one on the integument has been added. The chapter on development orientation, and chronology has been improved by supplanting the bulky charts of earlier editions with clearly written text supplemented by photographs illustrating development from the prestreak stage through hatching A new short description of the development of the lymphatic system will be of interest to laboratory scientists and to veterinarians concerned with the postmortem examination of poultry

The section on the embryology of the air sacs will be of special interest at this time to those workers investigating air sac infection" or "chronic respiratory disease of poultry The section in chapter 3 on optimal conditions for incubating the egg should be known by all laboratory personnel using embryonated hen s eggs An excellent index and bibliography are provided.—*Maj R O Anslow VC USA*

Endocrin Tr tme t in G r l Pra t d t d by *Ma A. Goldz b* M D and *Jos ph W G ld b* M D 474 page ill tr ted Spr g r Pub l h g C I N w Y k N Y 1953 Pr ce $8

The 21 contributors to this text admirably cover their subject. They have arranged their material according to the localization of presenting symptoms and the types of metabolic disturbance They point out that since cortisone and ACTH have come into use as pharmacologic agents other hormones could be used solely for their pharmacologic effects regardless of the presence of an existing deficiency The use of androgens in order to promote anabolism (protein s thesis and formation of new tissue) is a good example Contro ersial opinions are avoided and the have provided a concise practical authoritative volume endocrine therapy There is no bibliography

—*Col R E Blount MC u*

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BOOK REVIEWS

Oc tr ge s nd N oplas by *Har ld Burrows* d *Err S H rm g* w th Con tr b t o by *W C J R s* d *C W Sh pp* 189 p g s illu tr ted Ch rl C Th m Publ h Spr gf ld Ill 1952 Pr c $6 75

This book a composite of the authors extensive personal research and an exhaustive search of the literature, makes en joyable reading The intimate connections between endocrine glands and the close relationship of many neoplasms to endocrine influences are discussed Numerous questions are posed many are answered and others await further knowledge This volume is recommended to all who deal with tumors and should also be read by those who tend to use hormone therapy indiscriminately

—Capt L H Thomas MC USA

Sy ps f Ob tetr by *J n g C. L t b g* B Sc M D F A C S. Lat Prof or Em r tus of Ob t tr nd Gyn c l gy Un ty f M or Med l Sch l M ne p l M 4th d t on re is d by *Cha E M L na* M D P of s or of Ob tr c nd Gy ol gy St ford U ty S hool of M dicine San Fr c co Cal f 378 pag 157 llustrat ons i lud g 5 in lor Th C V Mosby Co St Louis M publ h 1952

This new edition of Litzenberg s text presents in a clear outline enough information to make it a value to medical students and general practitioners It also serves as a rapid review for those preparing for state board examinations Material found in the previous edition has been deleted expanded and rewritten

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A POST PREVENTIVE MEDICINE PROGRAM

THOMAS G FAISON *Colonel MC USA*

ONE of the most essential yet less spectacular missions of the Army Medical Service is that of preventing disease and injury A major concern of a post, army, or division surgeon is that of keeping troops healthy in order to promote efficiency and prevent manpower wastage Yet, with all the great scientific advances which have been made, a tremendous gap exists between what *is* done and what *can be* accomplished in preventing disease and injury This gap can be closed only when the Medical Service, command, staff, and the individual soldier understand and conscientiously co-operate in applying the fundamental principles of good environmental sanitation and personal hygiene A well-organized and well administered post preventive medicine program is essential in order to further this objective and to carry out effectively the responsibilities of the Medical Service in preserving the health of a command The World Health Organization has defined health as, "A state of complete physical, mental, and social well being and not merely the absence of disease or infirmity "

All causes of manpower wastage, including battle casualties, are amenable to methods of control or prevention The preventive medicine program should cover all factors which influence the health of military personnel, their families, and civilian employees Military preventive medicine cannot be limited to military personnel or to the confines of a military installation because the Army is an integral part of a community, either in the continental United States or in overseas areas

Command participation in a preventive medicine program is of vital importance because education, training, and discipline, which are command responsibilities, are important factors in the prevention of disease and injury

A preventive medicine program must be elastic and readily adaptable to new problems Once sanitation required and occupied nearly all the energies of such a program Sanitation was the major concern of the day and still must logically be considered first and as an important part of a health program As sanitary problems were solved greater effort could be diverted toward

communicable disease control As the principal cause of man power losses change, so must the point of greatest effort of an efficient preventive medicine program This is evident in the present concept of health which directs more and more attention to the problems of trauma and mental hygiene

ADMINISTRATION AND ORGANIZATION

Military preventive medicine administration may be defined as the art and science of organizing and operating an agency whose purpose is to promote the mental and physical health of a command The preventive medicine officer should direct under the general supervision of the post surgeon all post health activities Efficiency and economy can be best achieved if as many of the activities as possible operate from a centralized office or health center This center should contain space for all branches of the division and may also house a main dispensary and special clinics such as maternity and infant health immunization dental hygiene and venereal diseases Adequate transportation must be provided for the preventive medicine service

Preventive medicine is concerned primarily with well people in the sense that most of its activities are directed toward well persons The prevention of disease and trauma is a major concern and the line of departure from health is nearly always first noticed at sick call or the dispensary In order to keep constantly up to date on the health of a command preventive medicine personnel must know who when where and why people seek advice about their mental or physical condition Preventive medicine personnel cannot afford to sit in an office and wait for the hospital registrar or the laboratory to notify them that so many cases of a certain disease have been reported These reported events are by then of chief interest to the statisticians and historians Many conditions, such as diarrheas injuries, and neuropsychiatric complaints are never reported Preventive medicine must be part of or have very close liaison with the personnel operating the dispensary service because it is at the small unit or dispensary level that the correct combination of preventive and clinical medicine can be dispensed to lower significantly the days lost from disease and injury Close personal relationship of the unit medical officer and personnel of the command with the proper physician patient rapport elevates morale and constitutes an important contribution to the health of a command

Preventive medicine personnel especially the preventive medicine officer and health nurse must be primarily organizers administrators supervisors and teachers as well as expeditors

in order to provide maximal health services and benefits. Because health is a responsibility and concern of all personnel a preventive medicine program must be closely integrated with all post and extra cantonment activities concerned with maintaining the physical, mental and social well-being of all post personnel. Voluntary health and welfare groups should be used as much as possible.

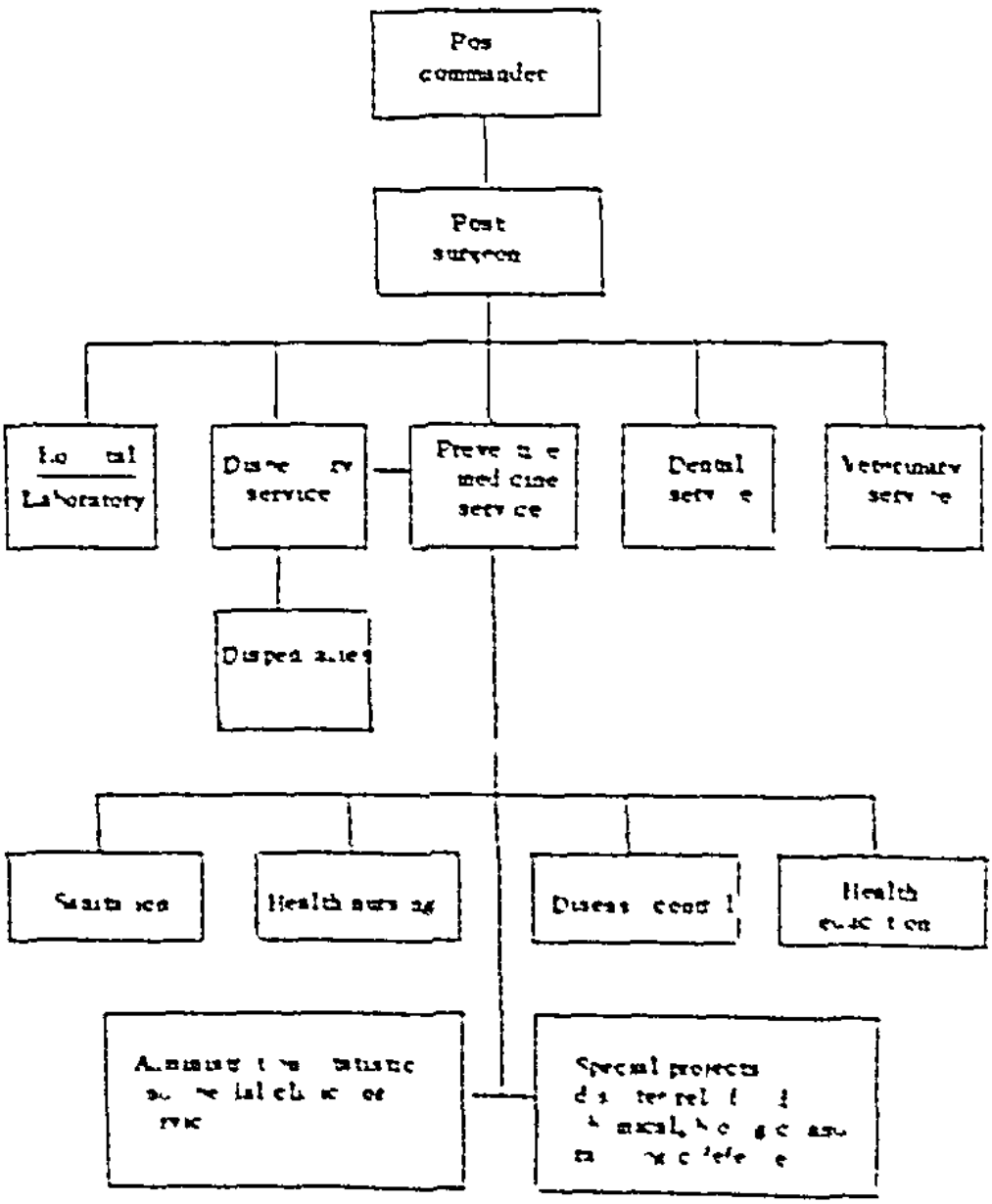


Figure 1. Organization of a post preventive medicine service.

Health nurses are one of the most important links in the chain of a useful preventive medicine service. They should have offices in the health center and work under the immediate direction of the preventive medicine officer. Duties of the nurse

should cover the entire field of preventive medicine activities *and should not be limited to such items as school health family* care, and communicable disease control The nurse is primarily a health educator and chief assistant to the medical officer in charge of the preventive medicine program In nursing care of the sick she teaches others to provide the necessary care In visiting the home, she provides family health guidance which includes sanitation personal hygiene and home safety The nurse is an essential element in family health activities She can visit all new families as they move on or near the post give information about clinics hospital service servants and schools as well as obtain and record initial family data for preventive medicine files

Maximal use of nonmedical personnel is essential in order to conserve the time of the medical officer and to improve the quality and quantity of services rendered Enlisted personnel should be trained to perform many of the routine duties Sanitary engineers entomologists nutritionists, industrial hygienists and sanitarians become part of the team when available A post preventive medicine service could be organized as shown in figure 1

SCOPE

The average post offers opportunities for a full and well rounded preventive medicine program Classified as activities these would consist of (1) sanitation, (2) health education ( ) communicable disease control (4) personal hygiene (5) prevention of accidents and trauma (6) industrial hygiene (7) certain aspects of medical care (8) administration and statistics, (9) mental hygiene (10) research and development (11) maternity and infant health (12) school health (13) oral hygiene (14) prevention of noncommunicable disease and conditions, (15) laboratory and (16) liaison

POST PREVENTIVE MEDICINE ACTIVITIES

The above named preventive medicine activities in general include responsibilities which a post surgeon delegates to a preventive medicine officer The relative values of these activities vary with geographic location, the characteristics of the people and community involved the mission of the command and other factors The preventive medicine officer must evaluate the importance of each activity to a particular post and carefully proportion the work and personnel available to the jobs to be accomplished Although the performance or supervision of such an activity as dental hygiene may remain entirely under the control of another service it is still a preventive medicine interest Whether these separate activities be organized and

administered by a single medical officer or by a large preventive medicine service, the principles involved remain the same

Sanitation There must be continued surveillance over all aspects of the post environment that might affect health This would include sewage disposal, water supply, waste disposal, housing standards and maintenance of buildings, insect and rodent control, food service and facilities, dairy products, recreational areas, bathing places, and extra cantonment sanitation Inspections of post installations and facilities are an essential administrative procedure and should be accomplished in close liaison with the post engineer, food service officer, veterinary officer, safety officer, post exchange officer, and/or the quarter master Unit inspections should always include the unit commander or his representative

Health education should cover all aspects of the preventive medicine program Health facts and problems must be presented by all health workers by means of personal contact, individual instruction, talks, films, and discussions to all personnel The preventive medicine officer should plan and evaluate post health education supervise all matters pertaining to health training, integrate medical indoctrination with the general troop-training schedule, and teach or give medical technical assistance as required to troops and civilian personnel These educational activities should be directed toward commanders, unit officers, leaders, enlisted personnel, staff sections, organized post groups (such as women's clubs, schoolteachers, and boy scouts), and local civilian groups (such as the local medical society and service clubs) Food handlers and domestic servants are groups which merit special attention Maximal use should be made of movies, film strips, pamphlets, and other instructional material available through the Department of the Army, other Federal agencies, drug houses, voluntary agencies, insurance groups food institutes, and colleges

Communicable disease control activities involve many of the normal duties of a preventive medicine group The principal methods used are Early diagnosis and treatment case or carrier finding surveys, immunization, suppressive or prophylactic therapy sanitation personal hygiene, isolation and quarantine, education clothing, and housing Preventive medicine personnel should conduct or supervise physical inspections, analyze reporting methods maintain records and charts and prepare special tabulations Accurate diagnosis should be obtained by frequent consultations with ward officers and the laboratory First cases and trends should be watched for by maintaining close liaison with dispensary surgeons Liaison with local health authorities should be maintained in order to have available

information on communicable diseases and vectors which are present in military surroundings (See also health education sanitation personal hygiene, and certain aspects of medical care)

Personal hygiene The preventive medicine program should include supervision of the training of personnel in matters pertaining to personal hygiene The effectiveness of personal hygiene of food handlers including domestic servants should be under constant surveillance The preventive medicine personnel should (1) supervise teach and evaluate venereal disease prevention methods (2) study the recreation rest and sleeping habits of troops (3) understand and discuss with commanders and staff sections the personal habits of troops including consumption of alcohol use of narcotics and sexual indulgence (4) recommend and evaluate the use of special protective clothing or devices and chemoprophylactic agents (5) recommend and supervise the methods of protection from the effects of heat cold and sun including proper use of clothing and equipment (6) provide prompt information and educational material regarding harmful plants foods beverages animals and arthropods especially when troops move to new areas and (7) evaluate and make recommendations regarding discipline and morale

Prevention of accidents and trauma Time lost as a result of accidental trauma is a major contribution to the total days lost from duty and trauma is the leading cause of deaths in military service Each post commander is required to designate a safety officer (AR 385 10) The preventive medicine officer should maintain close liaison with the safety officer and assist in planning and supervising safety education and training Special attention should be paid to the examination of drivers and equipment handlers Records and epidemiologic data of accidents which cause loss of time from duty or are fatal should be maintained by the preventive medicine service These data should be carefully evaluated Adequate studies recommendations and supervision should then be accomplished to prevent accidents Hazards of recreation swimming, fire, industrial operations and poisons should be determined and eliminated or personnel adequately warned of their presence

Industrial hygiene Surveys of all post activities should be made in order to catalogue the industrial operations which are being conducted Industrial hazards should be studied and, when necessary experts called in for consultations in order to determine the magnitude or existence of a hazard resulting from an industrial process Elimination of hazards and supervision of the use of protective equipment are important preventive medicine activities Accident prevention first aid, and the care and handling of machinery and equipment should be part of the

educational program Painting, use of chemical solvents, and many other routine post activities can be health hazards

Certain aspects of medical care and rehabilitation are important preventive medicine functions Personnel should be educated and trained to report early symptoms of mental or physical conditions to a medical officer Proper physician patient contact should be fostered so as to encourage such reporting The preventive medicine personnel should also (1) supervise nursing care and isolation technics, especially in the treatment of communicable diseases treated outside the hospital (2) maintain records of and assist in correcting or controlling defects of children, especially in relation to eyes, teeth, and congenital or orthopedic defects, (3) teach members of the family to take temperature, administer insulin, and carry out physical reconditioning programs and other treatments as directed by the physician, and (4) assist dependents in securing hospitalization and medical care, especially for crippling orthopedic conditions, tuberculosis and neuropsychiatric diseases when not available through post medical facilities

Administration and statistics The preventive medicine officer must organize and administer a preventive medicine division for the purpose of maintaining, protecting and improving the physical and mental health and efficiency of all personnel The chief activities of the preventive medicine officer are planning, advising, and supervising control measures against disease and injury He should (1) maintain close liaison with the post engineer, laboratory officer, veterinary officer, quartermaster, food service personnel, safety officer, interested staff sections (such as chaplain, provost marshal, G 1, information and education, and inspector general), local public health and medical authorities, and others (2) direct teams in detecting preventing, and eradicating preventable diseases, injuries, and environmental health hazards (3) plan and direct the preventive medicine training of medical personnel (4) develop and implement programs for the prevention and control of epidemics (5) recommend and supervise preventive medicine research projects, (6) develop programs for detecting and correcting organic and functional defects as well as public health nursing care of dependents (7) conduct inspections and supervise investigations and special studies to determine prevalence of disease and injury, (8) maintain surveillance over all environmental health hazards (9) recommend and supervise the administration of chemoprophylaxis and (10) plan, direct, and perform necessary technical functions in connection with chemical, biologic, and radiologic defense

The collection, tabulation evaluation and presentation of statistical data is an essential part of the disease and injury control program It is necessary to collect record and evaluate essential data in regard to strength age race sex births and deaths the incidence or prevalence of disease and injury the number of days lost from duty sick call rates immunizations and other data connected with the preventive medicine program. Reports and charts are prepared after studying collected data and should be a useful source of information for the surgeon and commander The preventive medicine personnel should make sure that the necessary disease death and birth reports are submitted to civilian health authorities

Mental hygiene The physical and mental health of a person are interdependent and a breakdown in one invariably affects the other Conservation of manpower therefore must also include a preventive program in mental health Most of the actions which determine mental health of troops are functions of command Preventive medicine personnel must be alert to policies and situations which precipitate neuropsychiatric disorders and recommend measures to alleviate or remove these factors The training of troops must take into account variations in individual physical and mental capabilities Classification and reclassification of troops must be a fluid process Constant attention must be given to the physical and social welfare of all personnel and constitutes what is known as care of the soldier or man management Preventive medicine should maintain records of unit sick call rates which are a sensitive indicator of unit morale and mental health Other indicators are AWOL and court-martial rates The preventive medicine officer psychiatrist (if available) unit or dispensary surgeons and unit commanders should work together in close harmony Chaplains and others are frequently helpful Mental hygiene is an art which the old family physician practiced skillfully The present methods of medical care tend to eliminate this vital human factor The need for adequate mental hygiene programs is great and should be an important part of a post preventive medicine program

Research and development The preventive medicine personnel should evaluate procedures and equipment to determine what improvements can be made Items of research interest in preventive medicine should be reported to surgeons and higher authorities The preventive medicine personnel should supervise and assist in preventive medicine research programs as established on the post and through appropriate channels should request the assistance of the Armed Forces Epidemiological Board consultants and others interested in disease and injury prevention procedures

Maternity and infant health The welfare and health of wives and children are of primary concern to all military personnel The hospital obstetrical and pediatric services (if such services are available) with the help of the health nurse, should operate clinics which will insure adequate prenatal and postnatal care of mothers and infants in accordance with policies set forth by the Office of the Surgeon General This service should operate through a health center under the supervision of the preventive medicine officer and public health nurse Medical officers and nurses from the hospital service, as well as voluntary workers, should be used, if available, in the operation of these clinics The public health nurse should be responsible for maintaining adequate records and the appearance at these clinics of the women and children Emphasis should be placed on the health of the well baby and not on the diagnosis and treatment of disease Guidance as to the infant's weight, habits, diet, and protective immunizations should be accomplished in these clinics The prenatal clinic should be integrated with the hospital or private obstetrical services The public health nurse should instruct groups of pregnant women in the health center in matters pertaining to prenatal hygiene and the preparation and purchase of essential equipment for the mother and infant. Displays in the health center should emphasize complete practical lists of items necessary for the home care of the infant. The public health nurse, in co-operation with the local health department, should train and/or maintain a list of hygienically satisfactory maids and practical nurses who can assume the home care of mothers and infants

School health The health program for schools under military jurisdiction should consist of (1) advice and assistance in health education (2) supervision of school sanitation, heat, light, and humidity, (3) physical examinations (about twice during a child's school life) (4) immunizations, and (5) home nursing visits in reference to disease prevention and correction of defects Although the preventive medicine officer should supervise and assist in making school health examinations, most of the work should be performed by other medical officers and volunteers Defects should be recorded, discussed with the parents, and essential follow up work accomplished in order to secure correction of defects Local public health or voluntary agencies might be used in conducting the program and seeing that defects are corrected When post children attend civilian community schools, the preventive medicine officer and health nurse should maintain close liaison with local school health agencies

Oral hygiene Dental surveys of troops, dependents, civilian employees, and school children should be accomplished and,

where possible, arrangements made for the correction of defects The educational program should contain information in regard to oral hygiene The efficiency of dental hygiene as taught in the schools can be evaluated by dental surveys Liaison and working relationships with post and local dentists dental schools, or dental societies should be carried out in order to correct dental defects

Prevention of noncommunicable diseases and conditions These include cancer diabetes heart disease arthritis epilepsy malnutrition and overweight and defects (orthopedic congenital visual and those of hearing and speech) The education of military and civilian personnel as well as medical officers must be accomplished in order to control or alleviate these conditions Special surveys to detect diseases and defects may be made the results recorded and nursing or medical follow up accomplished The co-operation of women s clubs parent-teacher s associations and local civilian or national voluntary agencies should be obtained

Laboratory The preventive medicine officer should be familiar with the laboratory services which are available locally at other military installations Army areas and at the Department of the Army level He should maintain close liaison with laboratory officers and evaluate or interpret laboratory reports when indicated In co-operation with the laboratory he should conduct special surveys to detect disease incidence or prevalence assist and supervise the proper collection handling and transmission of specimens and keep laboratory officers advised of preventive medicine problems which might involve extra or sudden u e of laboratory services

Liaison Establishing and maintaining a close bond of intercommunication with all groups or persons concerned with the health and welfare of a military installation is necessary in order that a health program may provide maximal service and benefits In the medical service this includes the veterinary officer dental officer industrial hygienist laboratory officer hospital registrar nutritionist medical intelligence officer and chiefs of hospital services and outpatient service or dispensary Other post personnel include the quartermaster engineer safety officer food service officer post exchange officer provost marshal chaplain personnel officer (G 1) and inspector general Liaison with the Navy and Air Force local state and federal health and welfare authorities and voluntary health agencies should also be maintained

SUMMARY

Preservation of health and prevention of manpower wastage through a preventive medicine program is a most essential activity of the Army Medical Service The fulfillment of the mission of the Medical Service depends to a great degree on the preventive medicine measures adopted at each Army post, camp, or station This program is designed to produce healthy, efficient soldiers, with a minimal wastage of manpower through illness, injury, separation, or death

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BOOK REVIEWS

The Physiologic Effects of Wounds Medical Department United States Army Surgery in World War II by The Board for the Study of the Severely Wounded North African-Mediterranean Theater of Operations 376 pages illustrated Office of the Surgeon General Department of the Army Washington D C. 1952

This volume presents the physiologic effects of wounds as observed by a group of well-qualified doctors who present a wealth of observations but few conclusions Determination was made of the consequences of wounds as evidenced by changes in body chemistry, blood, and urine when the patients were first hospitalized Data on blood losses, hematocrit, serum proteins, and ion balance were obtained and patients categorized as to the level of shock Significant and fairly constant variations from normal were observed although physical difficulties imposed on the analytic facilities and variations of environment and problems due to the exigencies of combat somewhat impaired "standard" conditions under which observations could be made Sulfobromophthalein studies of liver function were related to the severity of the wound, the time elapsed since wounding, and to anesthesia and operation Renal function was similarly studied using sulfobromophthalein glomerular filtration rates, concentration tests effective plasma flow, and tubular excretory capacity for para aminohippuric acid Although the lesions associated with traumatic shock were observed, few conclusions were drawn except that the fat vacuolation of various organs was evidence of parenchymatous injury An abundance of charts, tables, and a few excellent color photographs of crash injuries and gross and microscopic kidney lesions document in detail the material collected —*Col D S Henger USAF (MC)*

Syph l t Opt At phy by *W It L B t h* M D Cl l Profe or f N ur l gy d P y h try Ind U y S h l f Med Cl l Dir tor d *H d f the R ch* Depa tme t Ce t l S t H p l Ind p l Ind Spe l C l t th U S P blic H l h Se D of V ne l D W h g D C Ame Le tur Se P bl N 142 A M gr ph Th Ba on D f Ame Le ur Oph ha lm l gy Ed d by *D nald J Lyl* M D F A C S Prof or f Oph h lm l gy C ll g f Med U y f C C Oh 138 pag ll t d Ch le C Thom P bl h Spr gf ld Ill 1953 P $5 50

This comprehensive monograph is divided into 7 sections beginning with the introduction and including historical notes incidence and frequency of syphilitic optic atrophy and closing with its prevention The author devotes considerable space to the neuropathologic aspects of syphilitic optic atrophy and il lustrates the pathologic findings in several patients with many excellent photographs I e stresses the early diagnosis and treat ment of this disease This book should be of great value to the ophthalmologist and should be helpful to all physicians in making an early diagnosis and starting early treatment for this disease Dr Bruetsch is a recognized neurologist and authority on syphilis of the central nervous system He has included a very complete bibliography —*Col S L Cooke MC USA*

Th Ba f Cl l N ur l gy Th A my d Phy l gy f th N Sy t m Th Appl on t Cl l N ur l gy by *S muel B k* M D Prof or f N ur l gy C ll g f M d N w York U y 3d d on 510 pag ll t t d Th W lliam d W lkin C B l m Md p blish 1953 P c $7

This new edition has been extensively revised It is small handy and well written The paper has been improved and the printing is much easier to read than in the previous editions There is no justifiable criticism which could be directed toward this book which is the only one of its kind Although it is par ticularly useful for the neurologist and the neurosurgeon it is sufficiently readable to be of great value to the general prac titioner or anyone else interested in neurology

—*Condr H S Colony MC USN*

THE TREPONEMAL IMMOBILIZATION TEST IN THE DIAGNOSIS OF SYPHILIS

FRANK W CHORPENNING *Lieutenant Colonel MSC USA (1)*

ONE of the newest and most promising laboratory tests for use in the diagnosis of syphilis is the treponemal immobilization (TPI) test introduced by Nelson and Mayer *(2)*. It resulted from the development of a survival medium for virulent *Treponema pallidum (3)* and the observation of the phenomenon of specific immobilization of *T pallidum* by syphilitic antiserum in the presence of complement *(2)* This loss of motility is believed to indicate death of the organism *(2 4)* The test is the first successful in vitro measurement of specific treponemal antibody in syphilis and the antibody has been shown by absorption experiments to be distinct from syphilitic reagin *(2 5)*.

From the accumulated investigations of several workers with the immobilization phenomenon, it is now believed that the mechanism of the reaction is based on the specific combination of antigen and antibody *(2 5)* Although combination will take place in the absence of complement, immobilization will not ensue until complement has been added *(2 5 6)* The amount of complement fixed in immobilization appears to be very small *(5 7)*. The reaction is dependent, kinetically on the temperature and concentrations of antigen antibody, and complement *(2 8 9)*

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(1) 4th Medical Field Laboratory

(2) Nelson R A J nd Mayer M M Immobilization of Treponema pallidum in vitro by antibody produced in syphilitic infection J Exper Med 89 369-393 1949

(3) Nelson R A Jr Factors affecting the survival of Treponema pallidum in vitro Am J Hyg 48 120-132 July 1948

(4) Thompson F A J., Goldberg B G. nd Magnuson H. J Relationship between immobilizing and spirochetocidal antibodies against Treponema pallidum. J Bact 60 473 480 Oct 1950.

(5) Magnuson H. J., and Thompson F A Jr Treponemal immobilization test of normal and syphilitic serums J Ven. Dis Inform 30 309-310 Nov 1949

(6) Seldeen M. Personal communication

(7) Thompson F A Jr nd Magnuson J H. Studies on increasing sensitivity of treponemal immobilization test for syphilis Am. J Syph 35 21 34, Jan. 1951

(8) Nelson R A J Diedrick J A., Zbeltin H. E C., Stack P S., and Barnett M Studies on treponemal immobilizing antibodies in syphilis techniques of measurement and factors influencing immobilization J Immun I 66 667-685 June 1951

(9) Chorpenning F W U published data

For routine screening and diagnosis, the value of the standard serologic tests for syphilis (STS) which measure reagin is unquestioned There have been persistent comments *(10-18)* which clearly indicate the need for a serologic test based on the presence of a bacterially specific antibody This is particularly important in the study of the clinically negative patient whose serum reacts with the lipoid antigens of the STS and who may therefore be either a latent syphilitic or a biologically false positive STS reactor

THE TEST AS USED IN THE ARMY

For about 18 months the TPI test has been under study at the Army Medical Service Graduate School Washington D C having been instituted under my direction Although it unquestionably requires special equipment and well trained personnel it has proved to be a practical and reproducible laboratory procedure Other laboratories are successfully using it in the study of syphilis *(7 19-21)*

(10) K lme J A Cl l D g by Labor ory E m na ns D Appl Ce ury C I N w York N Y 1944 pp 552 555

(11) Da is B D B l g f l pos t l g for yph l M d 23 359-414 De 1944

(12) St k J H Be ma H nd Ingr ham N R Mod Cl l Syph l l gy W B Saund C Ph l d lphia P 1945 p 73

(13) N ur h H V lk E E k J O Cr g H W P nam F W nd C pe G R B l g f l p ve l g t for yph lis pr pa nd pr pe f ol g cally t um gl b l fr ct on bt d by f ct nal p p w h mm m lf Am J Syph G or & V D 31 347 373 J ly 1947

(14) Ericks J O V lk E Cr g H W C per G R nd N ur h H B l g fal p l g t for yphilis pr pa d pr pe f l g lly t m ugl b l frac ns bta d by oel tr p p tat Am J Syph Go or & V L 31 374 396 J ly 1947

(15) V lki E N ur h H Er ks J O nd Cr H W B l g fal p t l g t t for yph l p pa nd pr pe f m p fra t wh h h b l g f ls pos re Am J Syph Go or & V D 31 397 412 July 1947

(16) V lk E N ur h H nd Cra g H W B l g f l po t ns l g t t for yph l qua pe f inh b ph me Am J Syph Go & V D 31 413 43 J ly 1947

(17) N ur h H V lk E Cr ig H W nd E k J O B l g f l pos tve ea s l g for yph l pr l m na y ur y naly is w th ugl bul n- h b method for l g d ff iat on betw true nd b l g c f l pos t ns Am J Syph G or & V D 31 436-456 J ly 1947

(18) Putnam F W V lk E Cr g H W nd N ur th H B l g f l pos ive ea ns l g t for yph l pa ial purif t f bod f yph l h ma by d orpt f hly pr ipita d l m ph phat Am J Syph Go or & V Dis 31 457 468 July 1347

(19) N l P A J T p mal mm b l U S N vy Am J Syph 3 1 8 J 1953

(20) Dur l P Saus A d B l L J T p m l mm b l t t Br J V Di 28 68-79 1952

(21) R yn A nd N f H A P l m ma y f tr p mal mm b fir t (N ls) A ta d ma l T be p bl h d

The *medium* used for sustaining the treponemas in vitro contains a final concentration after serum and complement have been added of 2 percent fraction V of bovine plasma (Armour), 0 14 percent dibasic sodium phosphate, 0 05 percent monobasic potassium phosphate, 0 03 percent sodium thioglycollate, 0 03 percent glutathione, 0 02 percent cysteine hydrochloride, 0 01 percent sodium pyruvate, 0 06 percent sodium bicarbonate, 5 percent Simm s ultrafiltrate of ox blood serum (Microbiological Associates), and the remainder physiologic saline solution *(8)*. These components are prepared first as stock solutions of concentrations as shown in table 1 and are mixed just prior to use The stock solutions are stored in the deep freeze or refrigerator depending on their stability

TABLE 1 *Concentrations of stock solutions in percent*

Fraction V of bovine plasma	5 0
Dibasic sodium phosphate	1 42
Monobasic potassium phosphate	2 04
Sodium thioglycollate	1 5
Glutathione	1.23
Cysteine hydrochloride	0 63
Sodium pyruvate	1 0
Sodium bicarbonate	1 26
Simm s ultrafiltrate of ox blood serum	undilute

The ultrafiltrate of bovine serum is included to insure an adequate amount of the *T pallidum* survival factor Knowledge as to the nature of this factor, mentioned by Nelson *(3)* in his original paper, was gained by the studies of Rice and Nelson *(22)* A hitherto unknown crystalline compound, shown to possess a beneficial effect on the survival of treponemas in vitro, was isolated from beef serum and yields the formula $C_{12}H_{22}O_{10}$ It has a melting point of from 95 to 98 C and a specific rotation $[\alpha]_D^{28}$ +18 (H_2O, C 2 0) A concentration of from 3 to 375 gamma per ml of the compound was shown to prolong the survival of *T pallidum* to the same extent as did a 5 percent concentration of ultrafiltrate of bovine serum or "normal" tissue extracts

Treponemal suspension *T pallidum* (Nichols strain) in testicular emulsion are inoculated intratesticularly into male rabbits of about 2 5 kg weight and maintained in a new group of

(22) R c F A H and Nelson R A Jr Isolation f. m be f serum f survival factor for Tr ponema pallid m. J B l Chem 191 35-41 J ly 1951

rabbits by passage immediately after the onset of a definite orchitis After preliminary passages the average incubation period can be made to approximate 8 days When the early orchi tis (1 or 2 days after onset) is diagnosed by palpation the tes ticular syphiloma is aseptically removed from the scrotal sac sliced by making 8 transverse and 1 longitudinal sections and washed in chilled sterile 0 85 percent saline solution The slices are then placed in a flask containing medium under an atmosphere of 95 percent nitrogen and 5 percent carbon dioxide and gently agitated for 1 or 2 hours at a temperature of 35 C Counts of the number of the treponemas per ml in the resulting suspension are made by dark field examination and from 3 to 7 or ganisms per high dry field (calibrated at about 5 million per ml) is considered optimal The treponemal suspension is poured off centrifuged to remove any gross debris, and used for the test

Test protocol The test is set up after the manner of Nelson and Mayer (7) as modified by Nelson et al (8) This method uses 0 05 ml of serum 0 05 ml of undiluted pooled guinea pig serum as a source of complement (C) and 0 4 ml of the treponemal suspension Our guinea pig serum pool titers have ranged between 700 and 900 units of hemolytic activity as measured by the Kent EP_{50} technic (23) A parallel tube for each serum contains 0 05 ml of guinea pig serum preheated for 30 minutes at 56 C as a C free control After 18 hours anaerobic incubation at 35 C a portion of the test suspension is removed by platinum loop and a wet mount is prepared for dark field examination The percent of motile organisms in the control tube minus the percent of motile organisms in the test sample is divided by the percent of motile organisms in the control tube This gives the percent specifically immobilized We have followed Nelson s criteria of considering 50 percent specific immobilization a positive test from 20 to 49 percent immobilization as doubtful and below 20 percent as negative If quantitative results are desired the percent of or ganisms specifically immobilized with the various (at least 3) serum dilutions are recorded on a semilogarithmic graph plotting the reciprocal of the dilution logarithmically and the percent of organisms specifically immobilized linearly The reciprocal of the dilution at which specific immobilization of 50 percent of the treponemas occurs (IT_{50}) is read as the titer after the method of Nelson et al (8)

Controls In addition to the C free control for each individual serum as described above the following controls are included (1) one tube as the medium control being a tube in which 0 1 ml of saline solution has been added to the suspension instead of

(23) K J F T be p bl h d

serum and C and, therefore, indicating the ability of the medium to support survival of the organisms, (2) two tubes for determination of the presence of sensitization of the treponemas in vivo *(8)*, both containing treponemal suspension and ultrafiltrate of bovine serum instead of the test serum, one containing C′ and the other containing heated guinea pig serum, (3) four tubes for a 3-dilution positive serum control and a matched complement free control, and (4) the residual C′ examination (an approximate determination that an adequate amount of C′ remains in all test samples containing serum and C at the completion of the 18 hours of incubation)

Precautions Several special precautions are essential if good results are to be secured with the test To begin with, all serums to be tested should be sterile and free from preservatives Various therapeutic agents have been shown to kill treponemas in vitro even when present in minute quantities *(2 3)*. Although penicillin is probably the most effective and most frequently encountered among these, several other antibiotics are known to exhibit nonspecific immobilizing effects *(24)*

Another pitfall is the occurrence of either partial or complete sensitization of the treponemas by antibody produced in the animal host in vivo This occurs frequently in orchitides which have progressed too far Treponemas so sensitized will be immobilized by C alone and so may give what appear to be false positive immobilization tests Though monitored by the control tubes previously described, the use of sensitized organisms must be avoided because the results of all such tests have to be discarded Accurate diagnosis of the early orchitis is an art which can be learned with experience and careful daily examination of the animals will make it possible to avoid the occurrence of sensitization

Encouraging results of technics which use treatment of animals with nitrogen mustard *(25)* or with x radiation *(26)* prior to infection and thus inhibit the production of antibody by the rabbit have been reported recently An adequate supply of complement is essential if false negatives are to be avoided Caution is necessary because, in terms of 50 percent hemolytic units, the amount of C required to insure a completed reaction appears high The explanation is that a great loss of C occurs nonspecifically during incubation at 35 C The use of large amounts of C in the test mixture, as noted in the test protocol, and a careful residual C′ determination, made after the test is completed, provide a reasonable safeguard against false negative tests

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(24) N I R A Jr P rsonal c mmunicat on
(25) Seld M J and Mayer M M. P rsonal communication
(26) Nel on R A Jr P rsonal c mmunicatio

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(3) Kent J F T be published

entail an increased incubation time and/or greatly increased amounts of C Again, promising results have been reported which indicate that a higher degree of reproducibility may be attained when a longer test period is used *(25)*.

SPECIFICITY AND SENSITIVITY

The TPI test shows every promise of being extremely specific There have been no reports of valid positive tests being secured with normal human or animal serums, or in studies of diseases other than syphilis There has been 1 isolated instance of 6 positive tests being reported from a study of 63 *probable* biologically false positive reactors *(28)* These may well have been true syphilitic serums with low titer STS, but even including them as part of the 417 tests on human nonsyphilitic serums reported in the literature, the specificity is 99 percent This figure is of even greater significance in view of the fact that almost half of the serums were from patients with a variety of diseases other than syphilis rather than from normal persons

The sensitivity of the test is better than that recorded for any of the 5 standard tests as evaluated by the American Evaluation Committee in 1939 1940, and 1941 *(29)*. These include the major tests in use prior to introduction of cardiolipin antigen and the cardiolipin microflocculation test In evaluation studies at the Army Medical Service Graduate School, as reported at the New York City Cardiolipin Conference, 18 December 1947, the sensitivity (total positive and doubtful tests) of 2 of these cardiolipin microflocculation tests (Rein Bossak and VDRL) was about 81 percent The sensitivity of the TPI test, based on 911 valid tests of syphilitic serums collected from the literature (positive tests only), was 90 percent If doubtful tests were included, this figure would be better than 91 percent Many doubtful and negative results occurring in this group were from patients with early syphilis in whom, presumably, antibody had not yet been given time to rise to detectable levels

INTERPRETATION

Any laboratory test must be evaluated and criteria for interpretation established before it can be adopted for use This principle is especially important as regards the use of the TPI test as an aid in the diagnosis of syphilis, because relatively reliable tests (STS) are presently in use During the 4 years since the introduction of the TPI test, a number of studies have been pre

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(28) M hr C F Moore J E Nel o R A Jr nd Hill H J Stud es on relatio sh p of treponemal a t body to probabl b ol g c false pos ti e r l gic tests for yphilis Am J Syph 34 405-409 Sept 1950.

(29) Kah R L. Serology in Syph lis Contr l Williams & Wilkins Co Baltimore Md 1947

TABLE 2 *Summary of Results of TPI Test by Diagnostic Category*

Clinical diagnosis	Number tested	Ref number	Pos	Doubtful	Neg	Unsatisfactory
Presumed normal	20	(2)	0	0	20	0
	73	(5)	0	0	73	0
	81	(31)	0	0	80	1
	61	(8)	6	1	54	0
Total	235		6	1	227	1
Disease syphilis	20	(2)	0	0	16	4
	81	(5)	0	0	81	0
	87	(31)	0	0	84	3
	12	(31)	0	0	12	0
	2	(28)	0	0	2	0
Total	202		0	0	195	7
Primary syphilis	20	(2)	10	3	7	0
	22	(5)	10	1	11	0
	33	(31)	23	4	3	3
	11	(7)	6	1	4	0
Total	86		49	9	25	3
Secondary syphilis	20	(2)	20	0	0	0
	189	(5)	156	7	26	0
	31	(31)	31	0	0	0
	108	(7)	98	0	9	1
Total	348		305	7	35	1
Presumed latent syphilis	126	(2)	125	0	1	0
	51	(31)	51	0	0	0
	67	(28)	50	1	16	0
	5	(7)	5	0	0	0
Total	249		231	1	17	0
Latent syphilis	20	(2)	20	0	0	0
	74	(31)	73	0	0	1
	126	(28)	1 1	1	4	0
	1	(7)	1	0	0	0
Total	221		215	1	4	1

TABLE 2 *Summary of results of TPI tests by diagnostic category*—Continued

Cli ic l diagn is	N mber t sted	R f e e c umbe	P t ve	Do bt ful	N ga t	U at s fac tory
Co ge tal syph l s	5	(2)	5	0	0	0
	7	(31)	7	0	0	0
	1	(7)	1	0	0	0
T tal	13		13	0	0	0

S pp s d chr n c b ol g cally f ls pos t v STS t ctor

Th s patie t had trans t pos ti STS whil ill w th di eases oth r tha syphi lis

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Figure revis d to a tor l of 5 negati and 1 d btf l n e-exam nati n

sented which include data regarding such evaluation These are briefly summarized here in an attempt to establish some criteria for interpretation of test results

From a total of 1 342 tests reported in the literature, 917 were made on serums from patients diagnosed as syphilitic and 813 of these yielded positive results 190 were on patients with dis eases other than syphilis and 235 were on "normal" serums *These latter were all negative* except as noted in the next para graph The clinical categories are shown in table 2

With the exception of patients reported by Mohr et al *(28)*, a definite pattern is noted Patients with late syphilis are con sistently positive, and a few negative and doubtful tests occur in the early stages of the disease In this connection it is to be noted that 16 of these negative tests occurred in a group which had been diagnosed on the basis of probable syphilis There was no clinical basis for a positive diagnosis because they were presumed to have latent syphilis

Thus, we have a picture, similar to that in other immunologic responses, in which a period of antibody elicitation is necessary before serologic tests become positive The titer follows a *rising* curve during this period Experimental work in rabbits by Turner and Nelson *(30)* would appear to confirm this

It has been shown that the TPI test is at least 99 percent specific and can be relied on to give few if any positive *results* with nonsyphilitic serums Thus, our interpretation starts on the firm ground of exclusion of false positive reactions Admittedly,

(30) Turner T B nd Nels R A Jr R lat onsh p of tr ponemal mm b liz ng t body to mmun ty in syph l Tr A Am Phys cian 63 112 117 1950

the test is of no exceptional value in primary syphilis and can only be expected to be positive in about 57 percent of such patients This figure may change on further study because the series is small The greater dependability of the dark field examination therefore eliminates the necessity of the TPI test and the STS in the diagnosis of primary syphilis

In secondary syphilis the results to be anticipated with the TPI test have been questioned by Magnuson and Thompson (6 7) At first they found 17 5 percent negative or doubtful but upon re examination in the presence of adequate amounts of complement this finding was revised to 4 percent It is believed that the true figure lies somewhere between this and zero, but statistics on many patients will be necessary before this can be established For the present it will suffice to say that, although a few patients with early secondary syphilis may give negative TPI tests, the large majority will be positive For practical purposes we can expect these latter to be greater than 90 percent

In the final analysis the important point in evaluating the TPI test as regards its use in the diagnosis of syphilis is whether its employment will result in benefits to a greater number of patients To determine this it must be compared with the best of present diagnostic methods In the preceding paragraphs on specificity and sensitivity this has been done with regard to syphilis in general and it has been seen that the comparison is favorable Also it has been pointed out that use of the test is contraindicated in early clinical syphilis From this it can be seen that the greatest value of the TPI test is in the latent or late symptomatic stages of syphilis or with patients whose serum give biologic false positive reactions with STS

All patients with late syphilis examined by the TPI test have been positive except for 5 reported by Mohr et al (28) These latter patients had all been treated and their disease could not be shown to be clinically active at the time of testing Thus from a total of 233 such patients 2 percent or less had negative tests

Patients with latent syphilis and a history of suggestive lesions have yielded 100 percent positive tests but of 949 probably latent syphilitics reported only 93 percent had positive tests All 16 patients with negative TPI tests had been previously treated for latent syphilis Therefore it would seem that we can expect between 93 and 100 percent of latent syphilitics to react positively to the test, and on this basis we could fail to treat 7 or less out of 100 patients actually infected On the other hand if we rely on the STS in diagnosing latent syphilis, we may treat a larger number who have no syphilis (false positive reactors) This was pointed out by Kahn (29) who showed that each percent of nonspecificity may be 33 times that of sensitivity in terms of the

number of false positive reactors in a given population He also stated that the baseless assumption has been that "since persons who have syphilis give positive serologic reactions, those who give positive serologic reactions have syphilis " The latter conclusion has been disproved because supersensitive STS have been devised which give positive reactions consistently on some normal human and animal serums

In a comparative study of 496 untreated patients who were "seropositive only," only 51 percent of the serums positive by the Kahn test were positive by the TPI test *(19)* These patients were selected on the basis of a positive Kahn test in the absence of history, clinical symptoms, and treatment The difference in results, when compared with 93 percent for latent syphilitics, strongly suggests that the specificity of the STS is poorer than has been previously suspected

In addition to the above cited patients, a most interesting use of the TPI test was reported by Nelson et al *(31)* In their studies, serums which were repeatedly negative with the standard STS were obtained (1) from 5 patients who were carefully studied and diagnosed as having late symptomatic syphilis, (2) from 1 patient with proved latent syphilis, and (3) from 1 patient with late congenital syphilis with stigmata All of these patients had positive TPI tests

IMMUNOLOGIC CONSIDERATIONS

Magnuson and Thompson *(5)* stated that it does not follow, however, that the titer of the immobilization test is a direct measure of the patient's or animal's immunity " In 1950, Turner and Nelson *(30)* published results of studies on this relationship from which they concluded that "in general the level of immobilizing antibody is a reliable guide to the degree of resistance of the host to reinfection " Later Magnuson et al *(32)* presented further data on this relationship from which they concluded that the measurement of circulating immobilizing antibody is a poor measure of immunity

The immunologic relationship between the causative organisms of syphilis, yaws, and venereal spirochetosis of rabbits were investigated by Khan et al *(33)* Using the TPI test, they dem

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(31) Nel R A J Zheutli H E C D endruck J A and Aust P G M. J Stud on trep nemal mm b liz g a tibodie n yphilis incid c in serum nd ebrosp nal fl d i h mn bet g and ab en in b olog c fal posit r ctors Am J Syph 34 101 121 Mar 1950.

(32) Mag uson H J Th mpson F A Jr nd McLeod C P R lati nship betw en trep nemal imm biliz g ntibod e nd cquired immun ty i expe imental syphilis J Immun l 67 41 48, J ly 1951

(33) Kha A S N ls R A Jr and Turner T B Imm n logical relat onsh ps g mo g specie nd stra n of r l nt trep nemes as d term ned w th tr ponemal immob liz t test Am J Hyg 53 296-316, May 1951

onstrated a significant cross reactivity between *T pallidum* *Treponema pertenue* and *Treponema cuniculi* although the degree of reactivity using *T pallidum* and *T pertenue* antiserums against *T cuniculi* and vice versa was consistently lower than with homologous antiserum or in cross reactions between *T pallidum* and *T pertenue* This confirmed earlier animal challenge observations *(34)* and studies in man *(35 36)* which indicated antigenic cross reactions between *T pallidum* and *T pertenue* and to a lesser degree with *T cuniculi* They also studied the immunologic relationship of *T pallidum* to Reiter Nazan and S 96 strains of nonvirulent cultivable spirochetes No immobilizing activity against *T pallidum* could be demonstrated with antiserums produced by inoculation with nonvirulent spirochetes

CONCLUSIONS

The TPI test shows great promise in the diagnostic problems of syphilis such as the differentiation of patients who have latent syphilis from false positive reactors with standard STS Because it depends on the combination of a specific antibody with its antigen it has a very high specificity Its sensitivity is superior to the standard STS s and the reproducibility is as good as that of STS s in general The antibody measured is distinct from reagin

The test is indicated in the tentative diagnoses of latency or suspected biologically false positive reactions and it can be relied on to give positive results in at least 98 percent of patients with late syphilis In patients suspected of primary or early secondary syphilis its routine use is not indicated because presumably there is insufficient antibody to yield positive results in a higher percentage than would be discovered by the STS The precautions necessary to insure avoidance of false positive and false negative reactions are (1) prevention of significant in vivo sensitization of the treponemas used for the test and (2) provision for adequate complement in each test sample To assure these, certain controls are necessary

Although the TPI test must be performed carefully and is a complicated laboratory procedure it can be successfully used in a qualified consulting laboratory Four of the greatest difficulties in its performance show promise of solution The *first* of these is the need for fresh syphilomatous rabbit testes as a source of motile treponemas which may be surmounted by the preservation of the testicular syphiloma by freezing The *second* is the re

(34) Turne T B McLeod C nd Updyk E L Cr mmun y pe me f yph lis yaw nd l p oche osis of rabb t Am J Hyg 46 287 2 5 Sept 1947

(35) J hnel h nd La g J Syph lis nd F mboe m L b ue E pe m II U uchung kl W h hr 7 2133 2140 N 4 1928

(36) Tur T B R ista f yaw nd yph l pa oc la b yaw p och Am J Hyg 23 431 448, May 1936

quirement for an expensive air-conditioned rabbit room Preliminary data indicate this may be omitted without appreciable lengthening of the incubation period or introduction of any variable which will alter the end result of the test The *third* is the constant danger of obtaining partially sensitized treponemas from testicular lesions Preliminary data cited in the text indicate that the development of antibody in the rabbit host may be inhibited or delayed by pre treating the animals with nitrogen mustard or by x radiation just prior to infection The *fourth* involves the degree of reproducibility of quantitative results Here again the preliminary data of 2 groups of investigators suggest that a longer period of incubation of the test mixtures will allow for complete combination of anti body, antigen, and C Thus end point measurements may be made With this technic, minor variations in temperature and C concentration (provided excess C is present) will not change the final degree of immobilization

The TPI test provides a highly specific method of establishing, or eliminating, a diagnosis of syphilis in patients suspected of having infection on the basis of a positive STS

BOOK REVIEWS

Pain Syndromes and Their Treatment With Special Reference to Shoulder Arm Pain by *James M Tarsy* M D Chief Arthritis Clinic University (New York Postgraduate) Hospital New York Univer ity-Bellevue Medi cal Center Associate V siting Physician Bellevue and University Hospitals A sistant Clinical Profe sor of Medicine Postgraduate Medical School New York University New York N Y Chief Arthri tis Clinic St Mary s Hospital Brooklyn N Y 592 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $12

This bool is a study of all of the conditions that affect the neck and shoulder girdle area Doctor Tarsy approaches the sub ject from its anatomic, neurologic, myologic, pathologic, and orthopedic aspects He discusses the many syndromes that in volve the cervical area and the shoulder girdle and affords the reader a correlative viewpoint of each of them Treatment is particularly well delineated The author has relied heavily on the works of others and sagaciously has used the studies of Codman for many of his descriptions and illustrations An extensive bibliography is appended to each chapter This book should be of particular value to general practitioners, but orthopedists, in ternists, and neurologists will find much of interest in it

—*Capt J Love, MC, USN*

Clinical Appl at ons of Sugge tion and Hypnosi by *W lliam T H on* M A Ph D Pr fesso of Psych logy Un ty of Mi ne t M nne pol M 2d edit o 137 pag s Charl s C Thomas P bl h Sp gfi ld Ill 1953

This is an unusually well written monograph dealing with those principles of suggestion and hypnosis which have practical clinical application It was written by an eminent psychologist who for many years had worked closely and successfully with physicians and dentists Following a brief introduction the book outlines broadly the basic facts of suggestion and suggestibility then describes the professional use of hypnosis how to approach the patient degrees of the hypnotic state methods of hypnotic induction and posthypnotic suggestion Precautions in the use of hypnosis and group phenomena are discussed briefly The final chapter presents examples of the successful use of hypnosis in dentistry A selected bibliography is appended Whether or not they contemplate the use of hypnosis in their practices there are few physicians and dentists who would fail to gain new insights into doctor patient relationships by reading this book —*Maj R B Payne USAF (MSC)*

Cl c l All rgy by *F b K. H ns l* M D M S D tor Han l F nd t for Ed t and R h i Allergy Chief of Allergy Ser ce DeP l H p t l St Lo is 1 005 pag llust at d Th C V Mosby Co St L s M publ he 1953 P ce $17 50

This new book succeeds the author s less complete Allergy of the Nose and Paranasal Sinuses published in 1936 and can well serve as a standard text on allergy The entire field of allergic diseases is well covered and pertinent references to the literature are given at the end of each chapter Dr Hansel clearly points out how our present knowledge has been derived from immunologic principles discovered through animal experiments This immunologic theory is detailed, especially for practicing physicians but it is regrettable that there is only a minimum of interpretive comment Recent advances in therapy such as use of ACTH and cortisone are fully discussed Extensive space is devoted also to the problem of the allergic child and the chapters on respiratory allergy are outstanding The author advocates the exclusive use of coseasonal treatment in hay fever This and his use of a low optimal dosage in hyposensitization may be questioned by other allergists From these examples it is apparent the book is written from the author's personal viewpoint with, however a definite attempt to present other points of view For physicians desiring a comprehensive up to-date allergy text this book can be highly recommended

—*Col W H Diessner MC USA*

TUMORS OF THE ANTERIOR CERVICAL REGION

HAROLD C SPEAR *Captain, USAF (MC)* (1)

THE anterior cervical region comprises that area bounded bilaterally by the sternocleidomastoid muscles, superiorly by the lower border of the mandible and a line extending from the angles of the mandible to the mastoid processes, and inferiorly by the sternoclavicular joints and suprasternal notch It is within this area that the great majority of cervical tumors occur This article reviews briefly the differential diagnosis and treatment of the more common tumors of this region and presents illustrative case reports A simple clinical classification of the tumors as solid or cystic and midline or lateral has been used

MIDLINE TUMORS

Few solid tumors occur in the midline of the anterior cervical region Occasionally a hyperplastic lymph node is found in the center of the cricothyroid membrane and may be mistaken for a small thyroglossal cyst. Lipomas may occur in this area Adenomas of the thyroid isthmus often shift to one side or the other as they enlarge Significant pyramidal lobe enlargement occurs only postoperatively following thyroidectomy for toxic goiter

The 2 cystic lesions of the midline are the dermoid cyst (which may develop a persistent sinus opening following infection and spontaneous drainage and is treated by local excision) and the thyroglossal cyst, which occurs at any level from the base of the tongue to the suprasternal notch and at any depth from the subcutaneous tissues to beneath the pretracheal fascia (the usual location is at the level of the thyroid notch, slightly to the left of the midline) Thyroglossal cysts appear most commonly during childhood but may arise later Extirpation of the cyst and the entire thyroglossal tract is essential Because the tract either traverses or lies closely adherent to the central portion of the hyoid bone, removal of this section of the hyoid together with the tract is also necessary (2)

Case 1 A 30 year-old woman was admitted on 30 January 1952 complaining of a painless swelling in the left upper anterior

(1) U S Air Force Hospital Ellington Air Force Bas T x

(2) S trunk, W E. T h iq of rem val of cysts and s nus s of thyrogl ssal duct Surg Gy c & Obst 46. 109-112 J 1928

cervical region of 3 years duration She had noted fluctuation in size but gradual progressive enlargement and occasional tenacious, mucoid drainage in her throat which she associated with temporary shrinkage of the cervical mass There was no history of inflammation of or drainage from the mass Physical examination revealed a cystic mass 3 cm in diameter slightly to the left of the thyroid notch The mass moved upward on deglutition

On 31 January a Sistrunk operation was performed under endotracheal ether anesthesia through a small transverse incision over the mass A thin walled cyst was located under the anterior layer of deep cervical fascia between the thyroid cartilage and the hyoid bone A well defined thyroglossal tract extending upward and posteriorly from the cyst was removed with the central portion of the hyoid bone The tract was followed to the region of the foramen cecum The postoperative course was complicated by pneumonitis of the right lung which resolved with penicillin therapy The patient was discharged on 7 February

LATERAL TUMORS

The lateral portions of the anterior cervical region are divided into the submaxillary and the carotid triangles

Submaxillary region Mixed tumors of the submaxillary gland and chronic submaxillary sialadenitis usually caused by an impacted calculus in Wharton s duct are the commonest conditions found in the submaxillary triangle Lymphadenitis is usually manifested by multiple variably sized tender nodes due to a primary focus such as an infected tooth

Case 9 A 19 year old man was admitted on 22 November 1959 because of a tender mass in the upper right side of his neck which first appeared about 9 months prior to admission and was noticeable only when he was eating The mass became persistent between meals and on several occasions in the preceding 6 months it had become acutely inflamed requiring treatment with penicillin and warm compresses Physical examination revealed a firm tender mass 4 cm in diameter in the right submaxillary region consistent with a fibrotic chronically inflamed submaxillary gland An impacted calculus 0 5 cm in diameter could be felt within the central portion of Wharton s duct. This was confirmed by a roentgenogram

On 25 November the right submaxillary gland was excised under endotracheal ether anesthesia Normal gland tissue had been entirely replaced by fibrous connective tissue Wharton s duct which was enormously dilated was divided and ligated as it entered the floor of the mouth above the posterior margin

of the mylohyoid muscle The incision was closed without drainage The postoperative course was uneventful and the patient was discharged on 1 December with instructions to return for removal of the calculus Three weeks later he stated that he had been entirely well and refused the second operation

Carotid region The carotid triangle is a frequent location for many important cervical tumors that are often indistinguishable from one another except by surgical exploration

Branchial cysts occur most commonly in the carotid triangle, although they may be found anywhere along the anterior margin of the sternocleidomastoid muscle They arise from a branchial sinus and may appear at any age If neglected, they may become infected or give rise to branchiogenic carcinoma When soft and fluctuant, these cysts may be confused with lipomas, cystic hygromas, or hemangiomas When they are distended with mucoid fluid, they may be mistaken for primary lymphomas, carotid body tumors, metastatic lesions, or neurofibromas The tendency of branchial cysts is to enlarge outwardly, whereas carotid body tumors, which are deeply situated about the bifurcation of the common carotid artery, grow inwardly *(3)*

Case 3 A 21 year old man was admitted on 19 November 1952 because of a painless mass in the right upper cervical region It was first noticed 10 days previously by a friend who thought the patient had mumps Physical examination revealed a soft fluctuant mass, 6 cm in diameter, projecting from behind the anterior margin of the right sternocleidomastoid muscle, opposite the thyroid notch It appeared well-encapsulated although fixed at its origin which was deep in the upper cervical region The mass was not tender and no material could be expressed from it into the pharynx

On 21 November, the mass was excised through a transverse incision under endotracheal ether anesthesia It proved to be a thick walled branchial cyst, filled with viscid, mucoid fluid, which extended upward beneath the posterior belly of the digastric muscle into the floor of the submaxillary triangle where it terminated in a fibrous cord which was followed to the pharyngeal wall No fluid could be expressed from the cyst into its fibrous, stalklike origin The incision was closed without drainage The postoperative course was uneventful

Lipomas in lateral cervical regions can sometimes be distinguished clinically by their soft lobulations, but excision is necessary to eradicate the lesion and to verify the diagnosis

(3) Lahey F H and Warren K W Long-term appraisal of carotid body tumor with remarks on their removal Surg Gynec & Obst 92 481 491 Apr 1951

Cystic hygromas are endothelial lined multilocular cystic tumors of lymphatic origin containing serous fluid and generally appearing prior to puberty Therapy consists of primary excision of the smaller lesions but large ones are often best treated by conversion from multilocular to unilocular cysts aspiration and injection with a sclerosing solution From 4 to 6 weeks later the cyst may have contracted sufficiently to permit surgical excision

Lymphomas may occasionally make their initial appearance in the carotid triangle Accurate differentiation from lymph node metastases from a silent malignancy in the head or neck is impossible without biopsy

Case 4 A 40 year old man was first seen in January 1950 because of a painless left upper cervical mass that was first noticed 8 months previously The mass had gradually increased in size The patient had noted no recent loss of strength weight or appetite Physical examination revealed a firm oval apparently encapsulated mass 3 cm in diameter overlying the left carotid bulb and opposite the thyroid notch It was not tender and could be moved freely laterally, but seemed semifixed when up-and down motion was attempted Several smaller freely mobile firm discrete satellite nodes from 0 5 to 1 cm in diameter could be felt adjacent to the mass

On 28 January, excision biopsy was performed under local anesthesia The mass consisted of a firm encapsulated lymph node 3 cm in diameter which was bound to the carotid bulb by fibrous adhesions It was removed intact but several adjacent smaller nodes were left undisturbed Pathologic study revealed the lesion to be a giant follicular lymphoblastoma On 15 February the patient was transferred elsewhere for roentgenotherapy

A *discrete metastasis* to one of the lymph nodes about the carotid bifurcation may be readily suspected clinically if a primary lesion about the head or neck has also manifested itself When a primary lesion cannot be found the cervical mass should be excised and examined microscopically In a series of 22 carotid body tumors reported by Lahey and Warren *(3)* none were proved to be malignant A conservative attitude was recommended toward such tumors if excision would necessitate ligation of the carotid vessels If pathologic study of a solitary cervical mass reveals it to be a lateral aberrant thyroid tumor it is axiomatic that this represents a metastasis from a latent primary tumor in the corresponding lobe of the thyroid gland and this lobe should be totally removed

Infrahyoid region The important tumors of the infrahyoid region are derived from the parathyroid and thyroid glands Para

thyroid tumors include adenomas, which are only rarely palpable, and cysts and carcinomas which are medical curiosities (4) Excluding toxic goiters, which are beyond the scope of this report, nodular goiters, adenomas, chronic thyroiditis, and thyroid cancers remain A clinical differentiation between these lesions may seldom be made with certainty

Malignant tumors Opinion differs as to whether excision is indicated as a prophylactic measure for small to moderate sized nodular goiters which are otherwise asymptomatic Indisputable criteria for operation include rapid enlargement of the goiter, the presence of a suspiciously firm discrete nodule, pressure symptoms, including intrathoracic extension, and cosmetic deformity Beahrs and Judd (5) reported an incidence of malignancy of 7 percent in all nontoxic nodular goiters, both uninodular and multinodular, and they advocated prophylactic thyroidectomy because of the high incidence of inoperability (35 4 percent) in their series, once a clinical or pathologic diagnosis of malignancy has been made Crile (6) did not believe that the end result in cancer prophylaxis justifies the means, and questioned whether a subtotal resection of a nodular goiter is prophylactic in any event Cope (7) also questioned the logic of subtotal resection as a prophylactic measure How many malignancies have developed following prophylactic subtotal thyroidectomy for nodular goiter and how many small nodular goiters grow to produce pressure symptoms or develop into toxic goiters is not known The answer to these questions may influence the rationale of prophylactic excision for these lesions

The incidence of malignancy in the presence of a solitary thyroid nodule has been reported to be from 10 to 24 percent Most authorities agree that the solitary thyroid nodule is potentially malignant and should be removed Whether ablation should be by total lobectomy or by local excision, reserving total lobectomy for a second stage procedure in those patients in whom a pathologic diagnosis of malignancy has been established, is still a moot point Either approach is defensible at present

Case 5 A 30 year old man was admitted on 7 February 1952 because of a discrete asymptomatic nodule in the right lobe of

(4) Hoffman G T Collected review of palpable thyroid glands Internat Abstr Surg 95 417 426 1952 in Surg Gynec & Obst Nov 1952

(5) Beahrs O H and Judd E S Jr Malignant lesions of thyroid gland Surg Clin North Amer 31 1169-1177 Aug 1951

(6) Crile G Jr Factors influencing prevention and cure of cancer of thyroid Surg Gynec & Obst 91 210-214 Aug 1950

(7) Cope O Diseases of the thyroid gland part 2 (Medical Progress section) New Engl and J Med 246 451 457 Mar 20 1952

the thyroid gland that had been discovered on routine physical examination Physical examination revealed a firm nodule 2½ cm in diameter in the right lobe of the thyroid No other thyroid nodules were palpable and there were no enlarged cervical lymph nodes Both vocal cords functioned normally

On 13 February under endotracheal ether anesthesia the thyroid was exposed through a low collar incision A nodule 2 cm in diameter was noted in the inferior pole of the right lobe and multiple smaller nodules up to 1 cm in diameter were present in both the right and left lobes A bilateral subtotal thyroidectomy with removal of the isthmus was performed and the incision was closed with drainage Pathologic study revealed the lesion to be a multiple colloid adenomatous goiter The patient made an uneventful recovery

Comment This case illustrates the common error in the clinical diagnosis of a discrete thyroid adenoma or solitary nodule In such a situation when a multinodular goiter is found at operation it is wisest to proceed with a bilateral subtotal thyroidectomy

Case 6 A 53 year old man was admitted on 12 February 1950 because of a mass in the right lower cervical region of about 10 months duration It had fluctuated in size but had gradually and progressively enlarged and on several occasions had abruptly become distended producing local discomfort and some obstruction to respiration and deglutition The patient had observed no loss of strength weight or appetite

Physical examination revealed a firm slightly tender mass 3 cm by 4 cm in diameter within the right lobe of the thyroid gland The mass caused the trachea to deviate to the left No other thyroid nodules were palpable and there was no cervical lymphadenopathy Both vocal cords functioned normally Radioactive iodine uptake and tracer studies revealed euthyroidism in the presence of a large nonfunctioning solitary nodule in the right lobe On 28 February under endotracheal ether anesthesia a discrete solitary cystic nodule projecting from the right lobe of the thyroid was excised A generous amount of normal appearing surrounding thyroid tissue was removed with the mass and the incision was closed with drainage Pathologic study proved the lesion to be a degenerating colloid adenoma The postoperative course was uneventful

Comment This patient s history of episodes of abrupt enlargement of the lesion with associated tenderness and pressure symptoms served to establish a clinical diagnosis of hemorrhage into an adenoma which was confirmed at operation

Case 7 A 28 year old woman was admitted on 7 July 1952 because a painless mass in the right lower neck of 5 years' duration had gradually increased in size Physical examination revealed a firm, apparently encapsulated, nontender mass, 3 cm in diameter, within the right lobe of the thyroid gland No other thyroid nodules were palpable, and there was no cervical lymphadenopathy On 9 July, under local infiltration anesthesia with 0 5 percent procaine solution, a solitary nodule was excised from the central portion of the right lobe of the thyroid No other thyroid nodules were found The incision was closed without drainage Pathologic study revealed the lesion to be a thyroid adenoma which was not further classified The postoperative course was uneventful

Chronic thyroiditis is an infrequent lesion, which when encountered must be differentiated from cancer of the thyroid Riedel's type, or ligneous thyroiditis, is characterized by a stony hard gland which is adherent to adjacent structures and gradually produces pressure symptoms It may be unilateral or bilateral Hashimoto s type, or chronic lymphoid thyroiditis, is characterized by a progressively enlarging, occasionally tender goiter which is often associated with pressure symptoms It usually occurs bilaterally

Case 8 A 25 year old woman was admitted on 23 June 1952 because of a painless mass in the lower anterior cervical region of 5 to 6 years duration The mass had slowly increased in size and, within recent months, had been associated with mild pressure symptoms particularly when the patient was reclining Physical examination revealed a rather firm, nontender thyroid gland diffusely enlarged to about twice normal size without any palpable nodules No cervical lymphadenopathy was noted and both vocal cords functioned normally The blood cholesterol was 184 mg per 100 cc and the BMR was minus 24

On 26 June, a bilateral subtotal thyroidectomy with removal of the isthmus was performed under endotracheal ether anesthesia The thyroid gland was diffusely enlarged and firm, but no nodules were observed The incision was closed with drainage Pathologic study revealed a diffuse Hashimoto s type of thyroiditis The patient made an uneventful recovery and was discharged on 14 July to her family physician for treatment for hypothyroidism

The subject of *thyroid cancer* is confused by many pathologic classifications and by a similar diversity of recommended surgical procedures The diagnosis may be suspected clinically in the presence of a rapidly growing thyroid mass which is often unusually firm or fixed The occurrence of pressure symptoms, or

of vocal cord palsy in the cadaveric position are usually late signs Thyroid cancers are divided into 2 groups the slowly growing lesions which often remain localized for many years, and the rapidly growing diffusely invasive lesions, which are quick to metastasize, particularly to bone and lung tissue

Treatment of the slowly growing lesions should consist of total lobectomy if the lesion is unilateral and total lobectomy and contralateral subtotal lobectomy or occasionally total thyroidectomy if there is bilateral involvement In papillary adenocarcinoma removal of lymph node metastases either by local excision *(5 6)* or by radical neck dissection *(8 9)* should be accomplished concomitantly With such management an 80 per cent 10 year survival rate may be anticipated Malignant adenomas although growing slowly may spread by blood vessel invasion before any regional node involvement occurs and are associated with a less favorable survival rate *(5)* The rapidly growing tumors are often inoperable because by the time the diagnosis is established they have extended locally and distant metastases have occurred When feasible, these lesions should be radically excised The efficacy of radioactive iodine therapy as a palliative measure in selected patients with distant metastases has been reported to be enhanced by the performance of a total thyroidectomy preliminary to the administration of the radioiodine *(10)*

Case 9 A 29 year old woman was first admitted on 22 September because of a painless mass in the left lower cervical region of about 2 years duration It had slowly increased in size but was otherwise asymptomatic There were no symptoms of thyroid toxicity Physical examination revealed a firm discrete solitary nodule 3 cm in diameter, within the left lobe of the thyroid There was no palpable cervical lymphadenopathy and both vocal cords functioned normally The blood cholesterol was 186 mg per 100 cc and the BMR varied from minus 11 to plus 13

On 24 September an apparently well encapsulated, firm nodule was excised from the left lobe of the thyroid under local infiltration anesthesia with 0 5 percent procaine solution Pathologic study revealed the lesion to be a papillary adenocarcinoma with invasion of its capsule The postoperative course was uneventful and the patient was discharged on 29 September for radioactive iodine uptake and tracer studies at another hospital The

(8) Ca ll R B Ind f k d t ma f thyr d J Cl E doc l 10 1099-1107 Sept 1950

(9) W d G E H dr k J W d Ch mbe R G Ca m f hyr d gland. A Surg 131 473 493 Apr 1950 So h k J 43 375-384 May 1950

(10) Raws R W Rad od tm t f thyr d d (d or l) Surg Gyn & Ob t 96 118-120 J 1953

uptake proved to be somewhat below normal and tracer studies failed to reveal any evidence of thyroid activity beyond the limits of the normal locus of the gland On 5 November, still asymptomatic, she was readmitted Physical examination was negative except for a well healed collar incision The thyroid gland was not palpable and no cervical lymphadenopathy was noted Both vocal cords functioned normally, and all laboratory and roentgenographic examinations were within normal limits On 7 November, under endotracheal ether anesthesia, a total left lobectomy, together with removal of the thyroid isthmus, the strap muscles, and internal jugular lymph nodes, en bloc, was performed by extending the earlier incision No grossly involved lymph nodes were noted, and the incision was closed with drainage Pathologic study revealed no evidence of residual carcinoma The patient made an uneventful recovery Follow up radioiodine tracer studies revealed no evidence of activity outside of the remaining right lobe

Comment Excision biopsy of a clinically diagnosed thyroid adenoma was performed, followed by total lobectomy and a modified radical neck dissection when pathologic study of the permanent sections revealed the lesion to be a papillary adenocarcinoma Whereas such a 2 stage procedure, in the presence of a rapidly growing tumor, might compromise the patient's chances for cure, this would not seem to be the case in the presence of a slowly growing, encapsulated tumor Lahey and Hare *(11)* considered pathologic study of permanent sections of solitary nodules mandatory prior to a decision for or against radical cervical dissection

SUMMARY

The common cystic and solid tumors that occur in the anterior cervical region may be grouped according to their usual location in the midline, or in the submaxillary, carotid, or infrahyoid regions The midline tumors include adenoma of the thyroid isthmus, the hyperplastic pyramidal lobe, and the cystic dermoid and thyroglossal lesions Chronic sialadenitis, usually secondary to a calculus obstructing Wharton's duct, and mixed tumors of the submaxillary gland are found in the submaxillary triangle Branchial cysts, lipomas, cystic hygromas, lymphomas, metastatic lesions, carotid body tumors, and lateral aberrant thyroid tumors are conditions to be differentiated in the carotid area In the infrahyoid region, the common tumors include the nodular goiter, thyroid adenoma, the lesions of chronic thyroiditis, and thyroid cancer

(11) Lahey F H and Hare H F Malignancy in adenoma of thyroid J A M A 145 689-695 Mar 10 1951

BOOK REVIEW

U p l L d El t oc d graphy d V t d graphy I l d g th
Sta d d L d th V d V l d th Ca d A hythm d th
P pl f V d g phy by *Em l G ldb g* M D
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L ur M d C l mb U ty 3d d t o th ghly
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p bl h 1953 P $10

Although the author of this popular book bases his concepts on the premise of a point source of electromotive force in the heart and on the body s ability to act as a homogeneous volume conductor he discusses the possibility of these premises being open to question At this moment it cannot be said with certainty whether a writer who practically ignores the bipolar leads is well in advance of most electrocardiographers or is deviating to one side It may be significant that the author while largely ignoring the bipolar leads in most of the book returns to them in discussing vectorcardiography

Dr Goldberger uses the personal pronoun to an extent usually not observed in the medical literature His practice of taking tracings with the patient in the sitting position is likewise unconventional He takes pains to emphasize the differentation between ventricular strain and ventricular hypertrophy a distinction difficult to grasp if indeed there is such a distinction One gets the impression that the author believes that an electrode facing one ventricle gives almost exclusive information about that ventricle rather than representing a summation effect of both ventricles He also indicates that after myocardial infarction the heart may show rotation about different axes

He emphasizes the role of electrolytes particularly potassium on the configuration of the ECG In all sections he stresses the variations in normal and abnormal patterns resulting from different positions of the heart There is a good exposition of myocardial anoxia and angina pectoris The style is simple and clear and the illustrations on the whole are good The author gives extensive mathematical detail in developing his theories This book should be in the library of every cardiology department but is not recommended for the beginner in electrocardiography —*Comdr R C Parker Jr MC USN*

A CLINICAL REVIEW OF THIRTY CASES OF CARCINOMA OF THE PANCREAS[1]

JOHN C COUNTRY *Lieutenant, MC USN*

RICHARD FOULK *Lieutenant MC USN*

PRIOR to the advent of the Whipple operation, early diagnosis of carcinoma of the pancreas was only of prognostic value In a series of 27 patients with cancer in the region of the head of the pancreas, 30 percent survived for 3 years or longer following the Whipple operation *(2)* Because of the anatomic relationship of the head of the pancreas to the common bile duct and the ampulla of Vater, malignancies occurring in this portion of the pancreas are prone to produce obstructive jaundice relatively early in the course of the disease Neoplasms arising in the body or the tail of the pancreas do not produce jaundice routinely, and as a result they are not usually detected until the malignancy is well advanced and metastases have occurred A review of the clinical records of this hospital revealed that 30 patients with carcinoma of the pancreas were treated in the past 4 years The neoplasm was located in the head of the pancreas in about two thirds of the patients, but in no instance was a definitive operation found to be feasible In view of the fact that the diagnosis was not established in these patients until only palliative therapy was possible, their case records were reviewed with special emphasis on the early signs and symptoms

The mean age in this group was 55 (range 30 to 76) years Only 2 patients were 70 or over, which is in sharp contra distinction to the series of Brown et al *(3)* who reported 51 of 100 patients with pancreatic malignancy to be over 70

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(1) From th U S. N val Hospital Philadelphia P

(2) Cattell R. B d Pyrt k L. J Appraisal of pancreatoduodenal resection follow-p study of 61 ca A n. Surg 129 840-849 Jun 1949

(3) Brown R. K. Moseley V Pratt, T D and Pratt J H Early diagnosis of cancer of pancreas ba ed on clinical nd path log cal tudy of 100 aut psied cases Am. J M Sc 223 349-363 Apr 195

Berk (4) reported the ratio of men to women with carcinoma of the pancreas to be 2 5 1 Because of the nature of this hospital all of the patients in this series were men 17 percent were Negroes

TABLE 1 *R lativ frequency f nit al complaint*

I l mpla t	Numbe f pa
Ep g tr pa	7
P ght ppe bd minal quadra t	5
J und	4
Dyspepsia	3
B k p	3
W kn	3
Low bd mi l pai	2
Da k ur	1
C pat	1
Dia h	1
T tal	30

TABLE 2 *R lativ fr q ency f b f complaint*

Ch f mpl dmi	Numb f pa
J nd	8
Epiga tr pa	6
B k pai	3
P i l ght ppe bd m nal quadr t	3
Low bd m nal pai	3
Dyspepsi	3
W ght l	1
Los f ppet	1
P igh l w t bd mi l quadr t	1
Abdom nal w ll g	1
T l	30

The mean duration of the illness from the onset of the first symptoms until death was 6 months Six patients died within 2 months after the onset of their first symptoms but 7 lived 1 year or longer The mean time interval from the onset of the first symptom until admission to the hospital was 3 months Since the mean duration of the disease was about 6 months it becomes obvious that most of the patients had a well advanced malignancy at the time of admission The responsibility for this delay must be borne by the attending physician or the patient In many patients the initial symptoms were so vague that they did not seek early medical attention In others, it is probable that the mildness of the initial symptoms was responsible for the prolonged use of symptomatic therapy rather than intensive diagnostic investigation

For the purpose of this study the initial complaint was differentiated from the chief complaint on admission in an effort to detect the first signs of altered physiology in this disease

(4) Be k J k Diag f ma f pa In Bockus H. L. (d o): Pos gradua Ga troe l gy Pr ed Cour G Und th Spon or h p of The Ame ca C ll g f Phy ans De mbe 1948. W B Saund C Ph ladelphia Pa 1950 pp 336-346

The initial complaints were numerous, as is shown in table 1 The 4 most common were epigastric pain, pain in right upper abdominal quadrant, jaundice, and dyspepsia, in that order The chief complaints on admission are shown in table 2 On the basis of the above data, the appearance of (1) upper abdominal pain, (2) jaundice, or (3) upper abdominal pain and jaundice makes it imperative that the attending physician include carcinoma of the pancreas in the differential diagnosis

TABLE 3 *Relative frequency of symptoms present*

Symptoms	Number of patients
Weight loss	27
Weakness	25
Anorexia	23
Jaundice	21
Pain	20
Indigestion	15
Constipation	13
Acholic stools	13
Eructation	8
Melena	6
Diarrhea	5
Food intolerance	4
Bulky stools	1

Table 3 shows the frequency of all symptoms encountered Jaundice, which occurred in 70 percent of the patients, was associated with abdominal pain in 68 percent Painless jaundice was present in 23 percent of the patients Pain, which was present in two-thirds of the patients, was most commonly located in the upper abdomen, occurring in the epigastrium in 7 and in the right upper quadrant in 4 In 2 patients, the pain was limited to the thoracolumbar area In the remaining 7, it was poorly localized and was referred to as generalized abdominal pain Radiation from the abdomen to the back was noted in about one third of the patients who had pain as a symptom In a series of 37 patients with carcinoma of the body and/or the tail of the pancreas, as reported by Smith and Albright *(5)*, a similar type of pain radiation was present in 30 percent. Although we found

(5) Smith, B. K., and Albright, E. C. Carcinoma of body and tail of pancreas; report of 37 cases studied at State of Wisconsin General Hospital from 1925 to 1950. Ann. Int. Med. 36: 90-97, Jan. 1952.

no uniformity in the character of the pain, it was constant in most patients in our series Textbooks commonly mention that pancreatic pain is relieved by having the patient sit up Only 3 of our patients obtained relief in this fashion In about 95 percent the ingestion of food aggravated the pain In 2 patients the pain was aggravated by trunk twisting movements

Constipation or acholia occurred in over half of the patients Signs of enzymatic pancreatic insufficiency as evidenced by increased bulk of the stools were infrequently encountered but specific stool studies were not routinely performed Nothman *(6)* reported the presence of pancreatic insufficiency in carcinoma of the pancreas in 4 of 5 patients as demonstrated by the secretin test. He stated that secretions obtained from the duodenum after stimulation with secretin are reduced in volume and alkalinity In addition the pancreatic enzymes tend to be decreased or absent When the secretin test is employed in patients with carcinoma of the biliary tract the alkalinity of the duodenal contents and the pancreatic enzymes are found to be normal Brown et al *(3)* emphasized the careful examination of the stools in patients with pancreatic disease They believed that chemical macroscopic, and microscopic stool examinations are grossly neglected in patients in whom pancreatic malignancy is suspected They made a plea for studies designed toward demonstrating a quantitative increase in stool fat and undigested protein Melena occurred in some of our patients and it usually appeared in those whose disease was well advanced We do not believe that this sign occurs early enough in the course of the disease to be of diagnostic importance

The characteristic physical findings are shown in table 4 In all the patients in whom an epigastric mass was palpable it was thought to be separate and distinct from the liver The mass was usually described as being indurated and fixed Hepatomegaly occurred in two-thirds of the patients and was nodular in character in 6 Gallbladder distention was present at the time of operation or at autopsy in about half of the patients but it was palpable clinically in only 8

Cytologic study of the ascitic fluid failed to reveal the presence of malignant cells and this procedure was not considered helpful in establishing an ante mortem diagnosis Lemon and Byrnes *(7)* suggested that the early diagnosis of malignancy of the biliary tract or pancreas can be established by the cytologic study of duodenal drainage They recommended that cell block study of duodenal contents be instituted within 48 hours after

(6) N hma M M V l of f ct nal t t f d g osis f dis f pancreas A n. l M d 34 1358 1371 J 1951

(7) L m H M nd Byr W W Ca f b liary tra t d pa diagnosis f m yt l gy f duod nal pur on J A M. A 141 254 257 S pt 24 1949

the appearance of jaundice In addition, they have found this avenue of investigation helpful in the study of patients with questionable upper abdominal pain Bleeding esophageal varices and acute cholecystitis are cited as contraindications for this procedure

TABLE 4 *Majo findings on physical examination*

Signs	Number of patients
Jaundice	23
Hepatomegaly	19
Epigastric tenderness	13
Gallbladder distention	13
Epigastric mas	9
Ascite	8
Venous *thrombosis*	3

Venous thrombosis was infrequently encountered Sproul *(8)* and Kenny *(9)* reported a decided increase in the incidence of venous thrombosis associated with pancreatic malignancy, especially when the body or tail is the primary site of the cancer Kenny suggested that an abnormal substance secreted by the tumor cells or a hypersecretion of a normal substance is responsible for increased clotting McLachlin et al *(10)* believed that the antithrombin test is useful in detecting subclinical venous thrombosis

Laboratory studies corroborated the clinical impression of obstructive jaundice when present In these cases the serum bilirubin and the alkaline phosphatase were found to be markedly elevated, whereas the urine urobilinogen was decreased or absent The cephalin cholesterol flocculation and thymol turbidity tests were found to be significantly elevated in 35 percent of the patients on whom the tests were performed Total protein determinations were found to be normal in most patients Serum lipase and serum amylase studies were performed in about one third of the patients and were found to be entirely normal except for an

(8) Spr ul E E Car inoma nd enous thrombos f quency of associat o of ca ma body o ta l of pa creas with m ltiple ven us thr mbo s Am J Ca ce 34 566-585 Dec 1938

(9) K s W E As oc t n f carc m in body d t l of pa creas with mult pl o thromb Surgery 14 *600-609 Oct 1943*

(10) McLa hl n J P l R nd P t rso J C. Cr t cal luat n of ntithr mb n t fo no s thrombos s Surg. Gy c & Obst 94 297 301 Mar 1952

elevated serum lipase in 1 patient Johnson and Bockus *(11)* believed that determinations of the serum lipase are more important in the diagnosis of pancreatic disease than determinations of the serum amylase In 30 patients with carcinoma of the pancreas they found the serum lipase elevated in 16

A significant degree of anemia was present in about half of our patients Marked anemia occurred most commonly in association with far advanced malignancy Arkin and Weisberg *(12)* stressed the frequency in which a leukocytosis occurs in patients with carcinoma of the pancreas In our series leukocytosis over 12 000 occurred in about half of the patients Hyperglycemia and concomitant glycosuria were present in 20 percent of our patients According to Joslin et al *(13)* 12 percent of all malignancies in the diabetic population involve the pancreas whereas Hoffman *(14)* stated that only 2 5 percent of malignancies in the non diabetic population are pancreatic in origin

TABLE 5 *Locat f p cr t t mor*

S t	N mb
H d	19
Body nd t il	6
H d d body	3
H d body d t l	2
T tal	30

In our patients little or no diagnostic aid was obtained from the roentgenograms of the chest gallbladder visualization or barium enema Gastrointestinal series were performed in 92 patients and were normal in 9 a complete duodenal obstruction was demonstrated in 1 and in the remaining 12 extrinsic pressure defects of the duodenal bulb or stomach were demonstrated None of the films showed a widened sweep of the duodenum

Needle liver biopsies were performed in 4 patients The results were negative in 3 even though subsequent postmortem studies revealed that in 2 of these the liver was studded with metastases The specimen obtained in the last patient revealed malignancy

(11) J h T A. d Bock H L P ta us f um l pa Am. J D g Di 10 1 7 J n. 1943

(12) Arkin, A. d W b g. S W Ca m f pa l cal d p th l p udy f 75 Ga l gy 13 118 126 A g 1949

(13) J l E P Roo H F Wh P d Ma bl A T f Diab M llt 6 h d L & F b g Ph lad lph P 1937 p 582

(14) H ffma F L Ca f p cr N w Engla d J M d 211 165-169 J ly 25 1934

of the gastrointestinal tract The pathologist was unable to determine whether the tumor originated in the stomach or the pancreas Needle biopsy of the liver is of no value in the early diagnosis of pancreatic malignancy

TABLE 6 *Location of metastases*

Organ	Number
Liver	21
Peripancreatic nodes	15
Peritoneum	7
Lungs	6
Stomach	4
Omentum	3
Gallbladder	3
Duodenum	2
Diaphragm	2
Pleura	2
Common bile duct	2
Adrenal gland	2
Testes	1
Spleen	1
Skin	1
Colon	1

Twenty patients underwent an abdominal operation In 1, a Whipple operation was attempted, but the tumor could not be mobilized because of invasion of the mesenteric vessels In 13, only palliative procedures for relieving the obstructive jaundice were feasible because of multiple abdominal metastases In the remaining 6, laparotomy was performed In those who were followed until death, the average length of life after operation was 4 months The postoperative course was extremely variable Three patients survived for 1 year or longer and 1 was still living 14 months after a palliative cholecystojejunostomy and an enteroenterostomy

The sites of origin of the tumor as determined from gross surgical and/or autopsy findings are listed in table 5 The head of the pancreas was involved in 80 percent of our patients, which accounts for the high incidence of jaundice in this series Pathologic sections of tumor taken either at the time of operation or at autopsy revealed that 80 percent were adenocarcinoma The rest were classified as undifferentiated Table 6 shows the location of the metastases

CONCLUSIONS

If o year cures are to be achieved by operation early tumor detection is imperative Much has been done to make the lay public cancer conscious but even more important in reference to this disease is an increased index of suspicion on the part of the attending physician Upper abdominal pain and jaundice are important early symptoms of pancreatic malignancy

The appearance of obstructive jaundice with or without gall bladder distention calls for immediate diagnostic investigation which, in addition to the routine studies should include (1) cytologic study of duodenal drainage (2) determination of the serum lipase level (3) stool examination for evidence of pan creatic insufficiency and (4) the secretin test

If full use is made of the available diagnostic procedures it is anticipated that the poor prognosis usually associated with carcinoma of the pancreas will be improved

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BOOK REVIEW

M tabol Int r lat ns W th Spe ial R f r c to C l um T tions of th F urth C nf e J uary 7 8 1952 N w York N Y d t d by *Edw d C. R / nst* j M D Dir tor Okl h m M d c l R h In t t t d H p t l Okl h m C ty Okl Ed torial t t: *Sb l y L W ll* M S Sp nsor d by J h M y J F nd on. 262 pag s ill trat d P inted by P g As t Inc C ldw ll N J 1952 P $4 50

In this book a group of eminent scientists review and discuss recent developments in the study of cartilage tendon, bone and teeth The subjects discussed are (1) cartilage and bone matrix, (2) in vitro fibrogenesis of collagen (3) protein in tendon, (4) heart valves and bone (5) polysaccharides of mesodermal tissues (6) radioautographic studies on S^{35} (7) ion binding properties of cartilage, (8) local factor of calcification, (9) parathyroid extract (10) serum calcium level (11) tricalcium phosphate (12) crystal chemistry of bone and francolite, (13) dehydration studies (14) hydroxylapatite (15) sodium in bone (16) radio-phosphate exchange (17) skeletal deposition of fluoride and (18) caries susceptibility These subjects are basic and there is little direct clinical reference but they should be of great interest to all students of orthopedic surgery, metabolic disease and dentistry —*Comdr J S Thiemeyer Jr MC USN*

RESILIENT PLASTIC REPLICAS OF PATHOLOGIC SPECIMENS

CLEMMER M PECK *M D (1)*
FORREST V SCHUMACHER *M D (1)*
JOHN V NIIRANEN *Commander DC USN (2)*

TEACHING, research, and similar activities are difficult and, at times, almost impossible to accomplish in such fields of medicine as pathology, radiology, and surgery when demonstrations of surgical pathology depend on photographs, drawings, and formalin fixed specimens Previous attempts to reproduce models of gross specimens have been unsuccessful, owing to the nature of the materials used (e g , wax, plaster of paris, and molten metals) and the damage to the tissues prior to histopathologic examination

In the course of a recent clinical investigation, a plastic substance was used to make replicas of the gross specimens under study The accuracy of reproduction, the flexibility of the model, and the simplicity of the technic all proved so satisfactory that the procedure, as described herein, is recommended for general use The original alginate impression, which is completely uninjurious to all body tissues, can be made in a matter of minutes This permits the routine pathologic examination of the specimen to proceed without the complications of delay or histologic distortion

The procedure includes (1) taking an accurate (negative) impression of the defect and the surrounding area with alginate impression materials, (2) pouring a high heat (positive) investment on the impression, (3) dipping the investment model in wax, (4) imbedding the model and wax in high heat investment, (5) boiling out the wax and dehydrating the mold, (6) casting the mold in Linotype metal to make a negative, and (7) processing the resilient plastic replica to make a positive

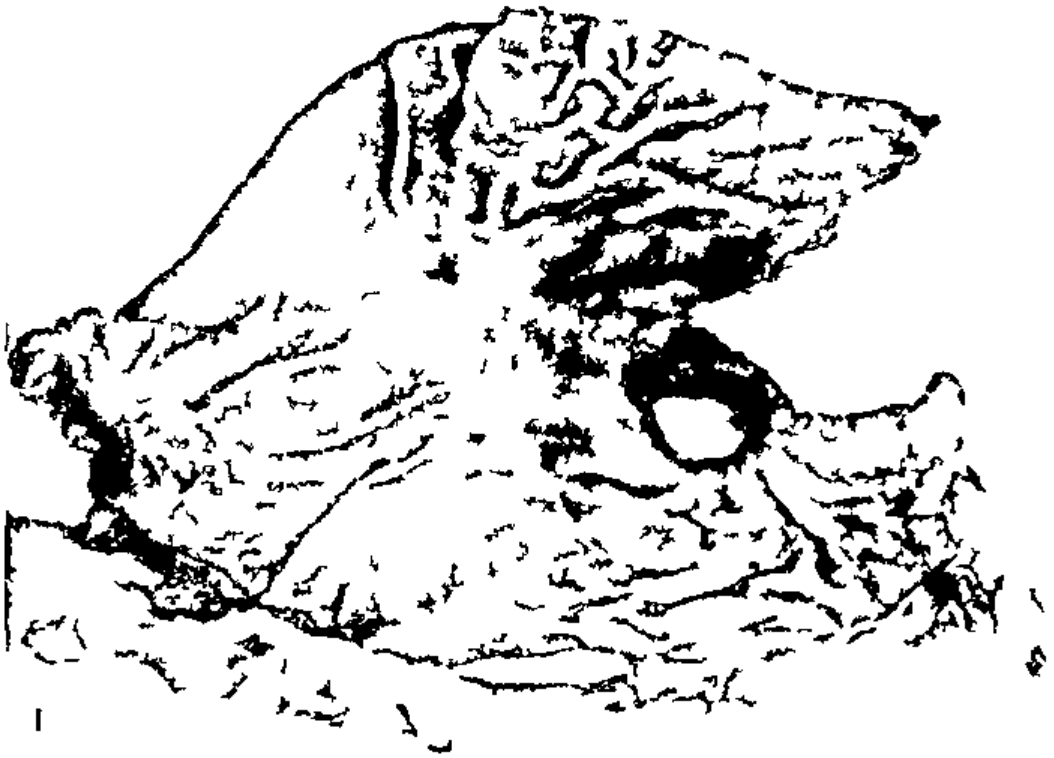
IMPRESSION

The equipment and materials required include such standard laboratory items as an interval timer, a plaster bowl and spatula, a 100-cc graduate, and alginate impression powder The fresh specimen is spread out in the desired position All foreign material is removed by a water bath, and free moisture is removed

(1) Radiologic clinic of Dr Grover Christ and Merritt Washington D C.
(2) U S Naval Dental School National Naval Medical Center Bethesda Md

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with absorbent cotton (fig 1) Alginate impression material is added to water in the proportions needed to produce a smooth creamy mix The consistency must be much softer than that





Figur 1 Or g nal gr p men. F g 2 Applyi g mpr m te l

required for dental impressions The soft alginate is allowed to flow slowly over the prepared specimen, care being taken to fill in any undercuts present without entrapping any air bubbles, until the specimen is completely covered to a depth of from 10 to 15 mm (fig 2) The impression is carefully removed from the specimen after 4 minutes The impression is rinsed with tap water to remove any secretions that may have adhered to its

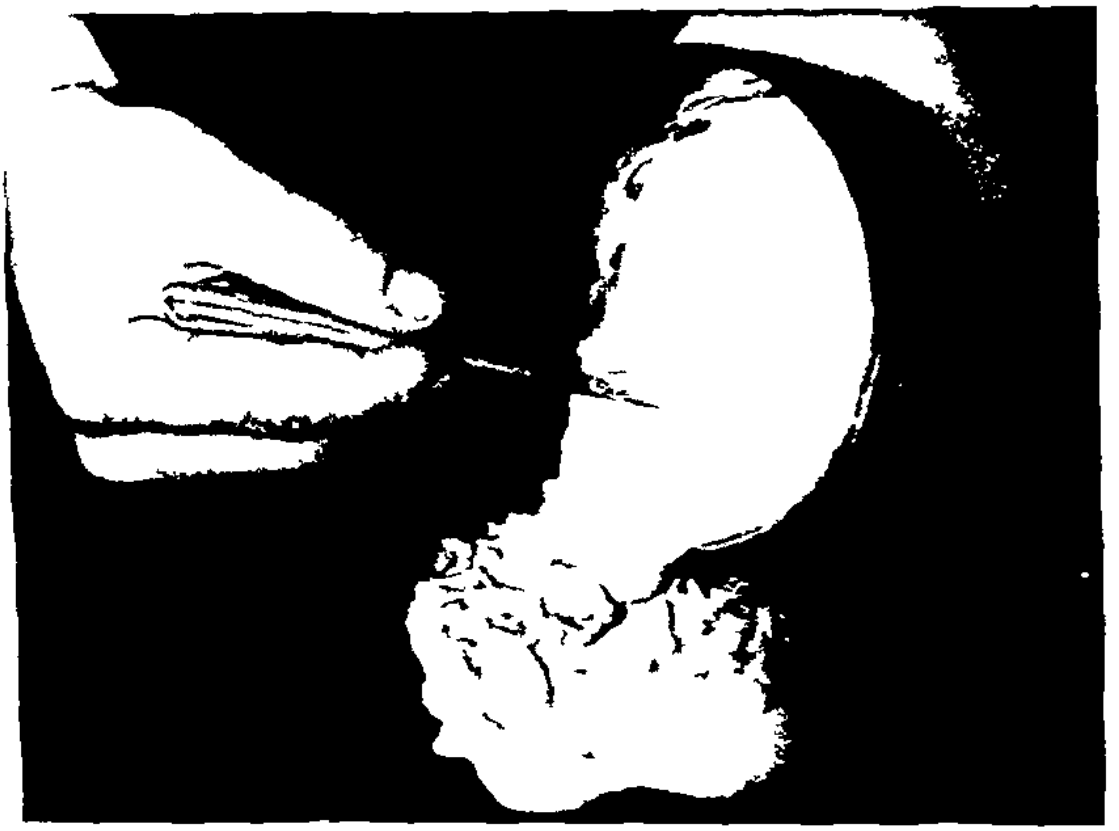


Figure 3 Applying investment material.

surface The impression is then immersed in a hardening solution and after the surface has hardened, it is rinsed lightly and excess moisture is removed

INVESTMENT MODEL

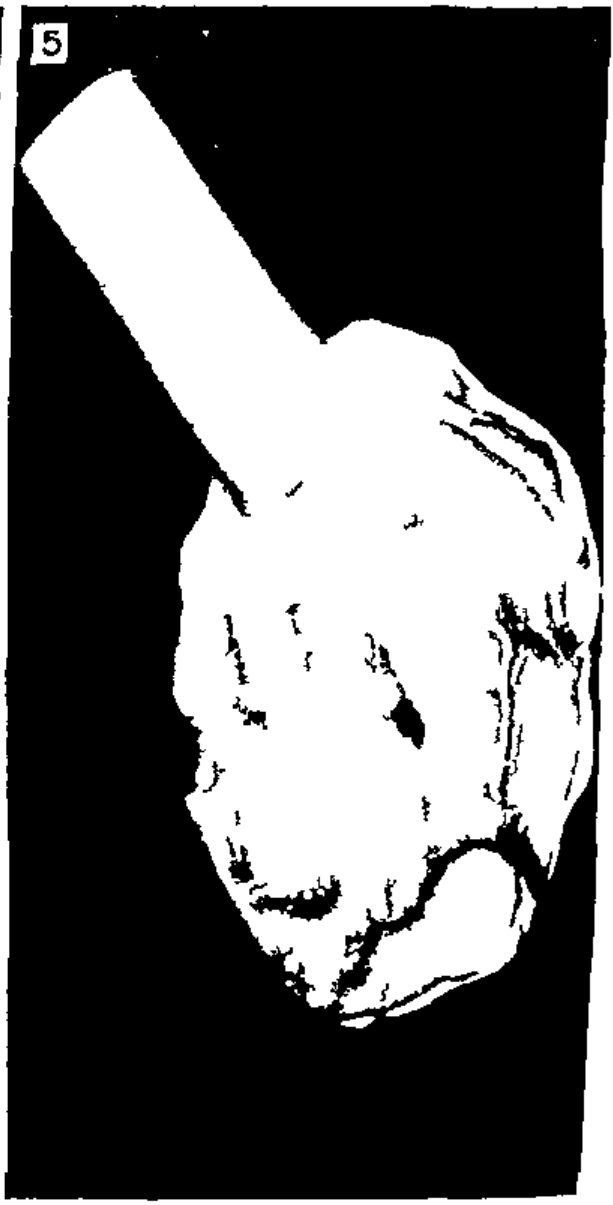
High heat investment is mixed according to the manufacturer's directions It is poured and agitated on the alginate impression until all parts of the impression are covered with at least 10 mm of investment (fig 3)

THE WAX COATING

The investment model is dipped in melted wax at 60 C until a layer about 3 mm thick covers the mold A mixture of 50 percent paraffin and 50 percent pink baseplate wax (dental) is

preferred (fig 4) The wax coating is allowed to cool then it is trimmed until only the area covered by the original impression is covered with wax A wax sprue is added to the wax coating to facilitate subsequent elimination of the wax and pouring of the Linotype metal (fig 5)





F gu 4 Wax g th m trent mod l Figu e 5 Wax d model w th pre pla

INVESTING MODEL AND WAX COATING

The high heat investment model and the wax coating are completely invested in high heat investment The end of the sprue is left exposed (fig 6)

POURING THE LINOTYPE METAL

The invested mold is immersed in clean, boiling water and allowed to boil until all the wax is melted and eliminated from the mold The mold is then placed in a dry heat oven at room temperature, and the oven is heated to 180 C Dehydration must be complete This can be tested by holding a cold mirror over

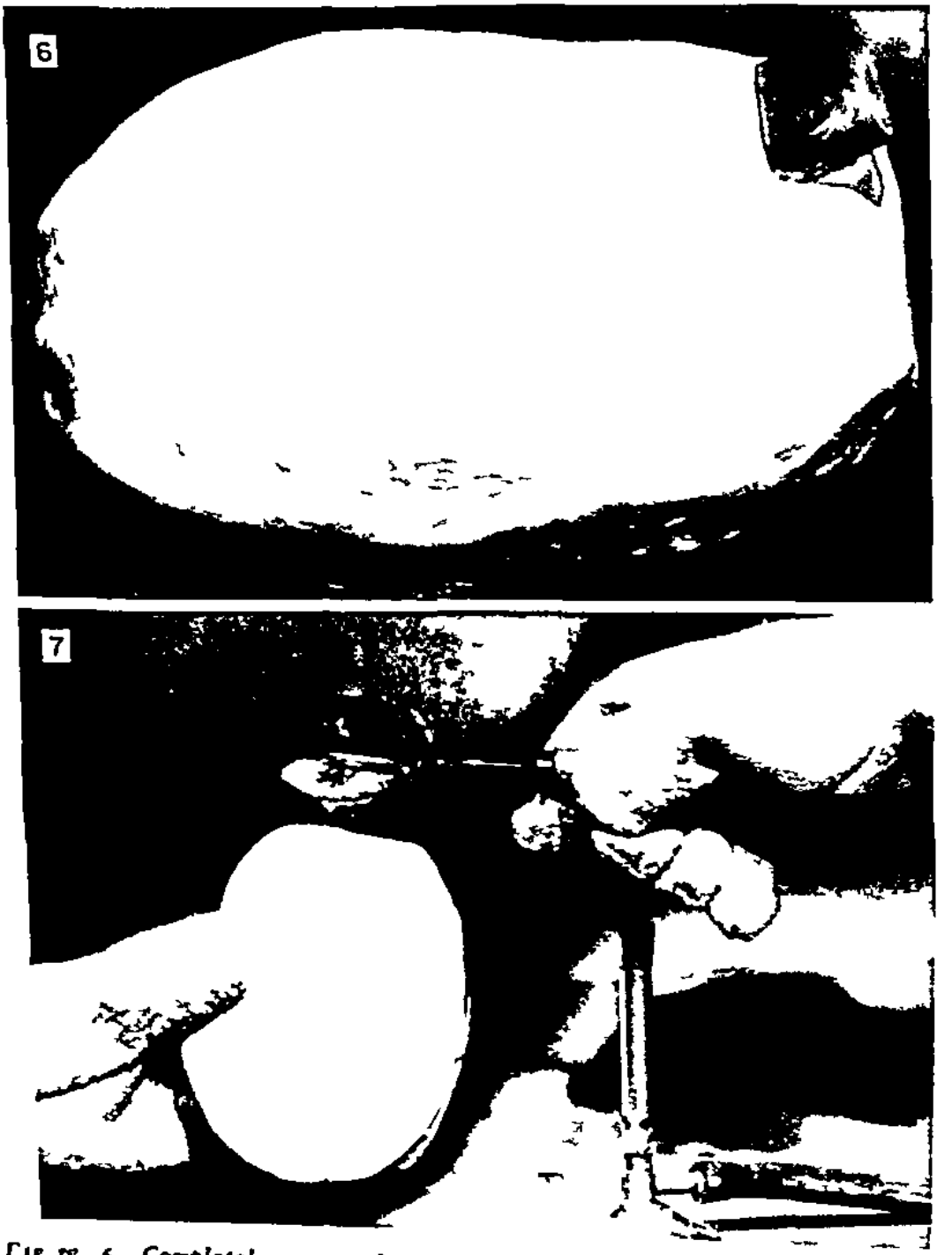
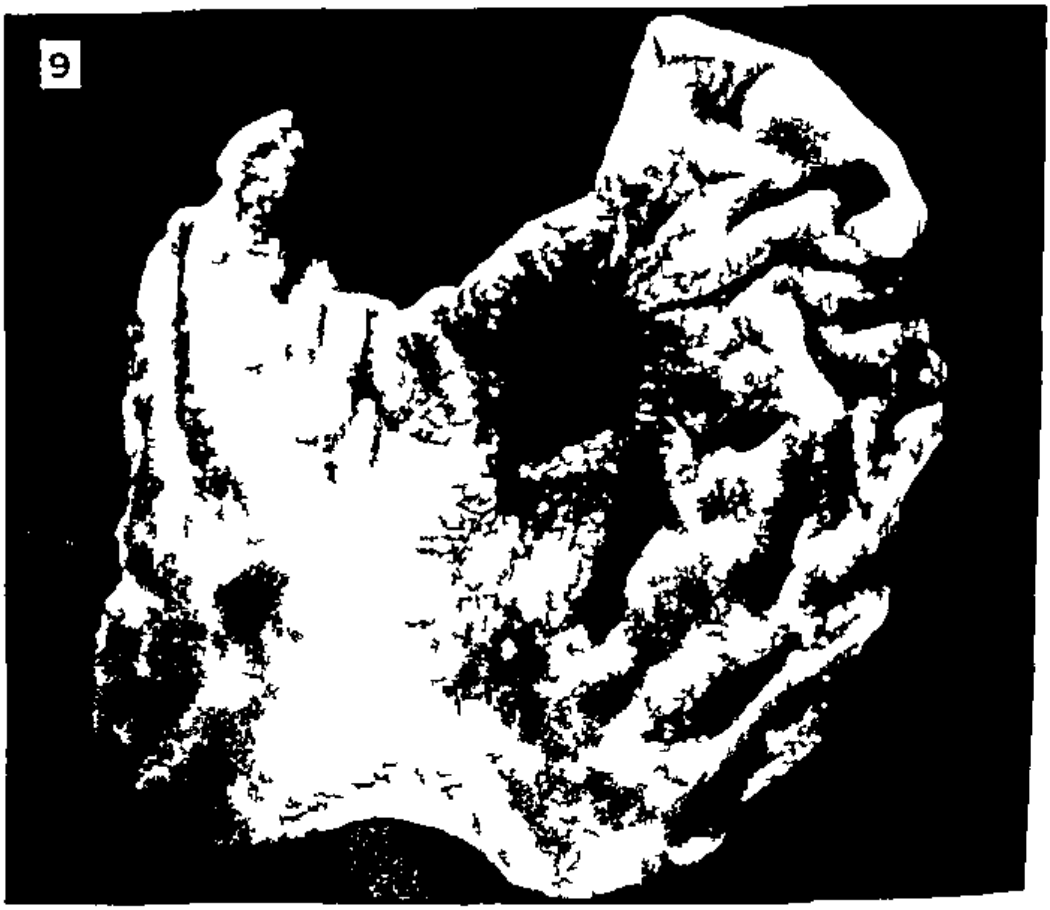


Figure 6. Completely invested waxed model Figure 7. Pouring the metal negative





Figu 8 Apply ng the n. F gur 9 C mplet d plast c mod L Compare this w th f gur 1

the sprue hole Linotype metal, which melts at 260 C , is heated in a crucible large enough to hold enough metal to fill the mold in one pouring (fig 7) To avoid cracking the mold, its temperature should approximate that of the metal After the metal has been poured and the mold has cooled, the investment is removed by striking it with a hammer Residue and small particles of investment are removed with a water bath and stiff brush

CURING THE PLASTIC RESIN

The resin used for the replica is a copolymer of vinyl acetate and vinyl chloride, prepared by the manufacturer in various basic colors Pigments are available to modify these colors The basic color of the specimen to be reproduced is prepared by mixing various pigments To test the mixture, a small amount can be cured on a glass slide held over a Bunsen burner The samples can be matched either with the specimen or with colored transparencies until the proper color is attained

After the metal mold has been heated to 100 C , a thin layer of the resin is brushed on with a camel s hair brush (fig 8) To stabilize the layer and prevent too much flowing, it is partially cured by holding it under an infrared heat lamp until the surface gets a dull appearance In the next layer, deviations from the basic color in the specimen are copied by applying different pigments as the colors wanted dictate This layer also is partially cured with the infrared heat lamp A third layer of the basic color is applied as necessary to build up the required thickness of the plastic specimen The final cure is accomplished by placing the mold in a dry heat oven at 180° C for about 4 minutes (fig 9)

CONCLUSIONS

Replicas of pathologic specimens may be made in resilient plastic materials in any numbers desired The process can be accomplished without injuring any part of the specimen and appears to offer a promising method for assistance in such fields as teaching, research, and clinical investigation

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W D Cap MC USA R l f ld h m ggl f ostb J L b. & Cl M d 41 114 121 J 1953

PSYCHIATRIC SOCIAL WORK IN A COMBAT AREA

RALPH W MORGAN *Major MSC USA*

THIS article is a report of my professional experiences in a military hospital in Korea An attempt will be made to answer the following questions (1) What are the functions of a social worker in a combat zone? (2) Are there essential differences in the technics, methods, and philosophy of casework practiced in this setting as compared with other settings? and (3) What are the lessons to be drawn from this professional experience which may be helpful to other social workers?

PSYCHIATRY, SOCIAL WORK, AND THE MILITARY MISSION

It is believed that a short restatement of the working relationship between social work and psychiatry, as modified by the military milieu, may be helpful as a frame of reference prior to a detailed consideration of these questions The sole purpose of an Army is victory in battle and the Army is organized toward that end Every branch of the Army has its particular function which it must carry out if the victory is to be achieved The function of the Medical Service is to conserve the fighting strength of the Army Military psychiatric social work is social work practiced in direct and responsible working relationship with military psychiatry which conserves the fighting strength through the diagnosis, treatment, and disposition of neuropsychiatric casualties

The patients referred to the military psychiatrist range from those with acute psychotic episodes to those with no demonstrable medical or psychiatric disease but who, nevertheless, have been unable to adjust to their military environment The diagnosis and treatment of these patients require that they be treated under medical supervision Most of them, however, are not those suffering from the severe forms of mental disease but those who have failed to adjust to their environments with resultant psychoneurotic symptoms or character and behavior disturbances The role of the social worker as a specialist in helping soldiers to adjust to their environments is, therefore, important

Military psychiatry in the combat area uses the principles of ego psychology with a degree of effectiveness which caused

favorable comment by the civilian psychiatric consultants who visited Korea Psychosomatic symptoms in the combat area yield to ego centered therapy far more readily than similar symptoms treated in civil life by experienced therapists The overwhelming nature of outer reality and the close identification of the soldier with his unit combine to produce a milieu in which ego psychology is particularly effective

Social caseworkers with a traditional function of helping persons to adjust to social reality were quick to recognize the helpful insights which ego psychology offered on its inception The emphasis this dynamic psychology places on the present and on the interaction of a person and his environment provided caseworkers with a more clearly delineated rationale for their methods than previously had been available Professional training in social work has thus long included rigorous grounding in the principles and methods of ego psychology

In discussing the roles of psychiatry and social casework in a child guidance clinic Ackerman *(1)* said

> The dy m l l t wh h th tw pr f m t th o- ll d g l l Eg t rm wh h pr t th orga g fu t on f h t t l per l ty Th f t d pt ly patt d r t d both tow d the o t r r l world d t w d th fl t b twe imp l d Th dy m l k betw d d l mot t d th group mot t on i th go. It i t th l l th t th f pecial t t f p y hiatr t d w k m t

The emphasis on ego psychology in both psychiatry and social casework means that for both disciplines there is a wide area of concurrent function whether the setting be a civilian child guidance clinic or the neuropsychiatric service of a military hospital in a combat zone

THE SETTING

The evacuation hospital to which I was assigned from August 1951 until January 1952 was located in a group of brick buildin s which had previously housed a Korean trade school Because of its location it was the first medical installation with psychiatric personnel to the rear of the division psychiatrists The neuropsychiatric service consisted of 3 wards with a total capacity of 70 beds In addition to the divisions served the many service units in the area provided a heavy outpatient load

The commanding officer of the hospital during most of this period had been trained as an internist He was well oriented in psychiatry and the functions of social work and his active interest and support were invaluable in enabling the psychiatric

(1) A k ma N w l Ham l G P y h h py Ch ld G d C lamb U f yP N w Y k N Y 1947 p

team to accomplish its mission The chief of the neuropsychiatric service was a forceful, energetic medical officer who had completed his residency training in psychiatry In August 1951 I was the only other professional officer, except for 3 psychiatric nurses, assigned to the service The large number of patients on the service and in the outpatient clinic meant that all of us had to work long hours and that the chief of the service would be unable to supervise my work closely Because both of us were aware of the capabilities and limitations of social casework in the military setting, however, an immediate favorable working relationship was established, which endured without interruption throughout my assignment to the hospital

The psychiatric team which functioned at this hospital was constantly changing and, therefore, difficult to describe There were never more than 2 psychiatrists present, in addition to the chief of the service The ancillary personnel of the team, other than myself, consisted of the 3 psychiatric nurses, a varying number of neuropsychiatric technicians, a clinical psychology technician, and an occupational therapy technician In the daily conference, which all of the team members attended, there was a free exchange of opinion and full understanding and agreement by the team on the courses of action to be taken regarding the patients discussed Through the leadership of the chief of service, every member of the team felt that he had a definite and important role to play in the treatment and rehabilitation of the patient

As with every group of people, this team had a collective personality which was more than the sum total of the personalities of those who composed it. The feelings of unity and zeal experienced by all of the team were of an intensity unachieved in any other setting with which I am familiar This can best be illustrated by an analogy from civil life People on trains are much more friendly toward each other than they would be without their shared travel experience should the train become stuck in the snow or derailed there would be a further intensification of positive group feelings In the military setting where the identification of a person with the group is consciously encouraged and where the group shares the same food, sleeping facilities, work, and dangers over a period of months, there is an intensification of group feeling which must be experienced to be fully appreciated.

The group dynamics which operated in this environment to cause patients to respond so readily to treatment were thus also operative in influencing the members of this therapeutic team toward the enthusiastic co-operation which characterized our treatment efforts

FUNCTION

In the service there is a saying There are no specialists on the battlefield " This is true in that in emergency situations every soldier must be prepared to advance the victory through any action on his part which he or his superiors deem necessary I had many duties toward this end while in Korea which were not social work functions The 2 most important activities of this kind were acting as the executive officer of the hospital for a short period and serving as administrative officer for the neuropsychiatric service The commanding officer of the hospital and the chief of the neuropsychiatric service however regarded these functions as secondary to that of psychiatric social work It was found however that these secondary duties were professionally helpful because they facilitated the intake process and a more effective liaison with the hospital headquarters regarding patients administrative problems

The professional day began with a group orientation for all new patients who had arrived on the service since the previous morning An explanation was given them about where they were and the nature of the treatment they were to receive They were brought to recognize the fact that they had been sent to our service because a medical officer had examined them and found them in need of treatment for the emotional disorders from which they suffered It was explained that their treatment in most *instances would consist of talking with the staff, taking part* in the activity program rest and recreation An opportunity was provided for questions and attention was given to their immediate needs

In the activities program for which I was responsible a hospital atmosphere was rigorously avoided This was accomplished through a strenuous schedule of mental and physical activity which prevented idleness and the resultant secondary gain that occurs when patients are allowed to become preoccupied with their symptoms The psychotic patients were kept in pajamas on a separate ward and all other patients were dressed in fatigues and were required to function and behave in a soldierly manner Various sports such as baseball volleyball, and horseshoes were added to calisthenics to provide physical activity Group discussions on the progress of the war or current events were held when possible A reading room was constructed on the ward with the crests of the combat divisions in Korea emblazoned on the walls and bright cheerful curtains were provided by the American Red Cross

The traditional psychiatric social work function of taking social histories was a minor one in this setting A few patients who presented diagnostic problems required social histories with information obtained from collateral sources A more fre-

quent task was that of interpreting patient's illnesses to commanding officers, to medical officers on other services, or to other interested parties

Although organized community resources, as known in civil life, are lacking in the combat zone, all really necessary health and welfare services are provided The American Red Cross staff of the hospital, rendered its usual service in recreation and in its liaison function with the patient's home community Patients with religious problems were referred to chaplains after an interpretation of their illness was given by the social worker

A research project, initiated by the chief of service, and a special study on combat exhaustion which was desired by higher authority, were undertaken Along with the psychiatrists and psychiatric nurses I took part in training classes held after duty hours for the neuropsychiatric technicians The bulk of my time, however, was spent in interviewing patients referred by the chief of service, who assigned patients to the various staff members during the daily staff conferences

Two case histories, which indicate the wide range of casework function in this setting, are presented The first is that of an inpatient who was treated on a short term basis for a conversion reaction which was acquired in combat The second is that of a rear area soldier who was treated on a long term basis (mostly as an outpatient) for a psychosomatic disability which was a manifestation of an underlying passive-dependent personality structure Although some treatment failures inevitably occurred, these 2 patients are representative of most of those who responded to treatment.

CASE HISTORIES

Case 1 Five days before being evacuated, a 23 year-old soldier, who had been in combat for 3 months as a truck driver in an infantry regiment, noticed a tingling sensation in his legs when he climbed into his truck to take ammunition to a forward position On his previous trip forward, the truck ahead of him had been demolished by a mine and the driver of the vehicle killed The tingling sensation in the patient's legs changed to a progressive weakness as he continued his driving He finally had to be taken off driving but his inability to walk made him useless in the division area. He was evacuated to the division clearing company, but he did not respond to the 48 hours of rest and sedation given by the division psychiatrist The patient was then evacuated to a mobile army surgical hospital and on the following day evacuated to our service Examination by the chief of service confirmed the diagnosis of conversion reaction and he was assigned to me for therapy

about returning to combat. There was no discussion with this patient of childhood experiences the emphasis in the interview being on the present situation. No attempt was made to develop emotional insight because the situation did not permit that type of therapy nor was it indicated for this patient

The progression in the use of the various casework methods with this patient was rapid and condensed because of the milieu in which this work was done Not all patients however responded so dramatically to treatment as the following case illustrates

Case 9 An immature 23 year-old finance clerk who served in a headquarters near the hospital was first seen in the out patient clinic in August 1951 having been referred by the medical service with a diagnosis of psychogenic gastrointestinal reaction He had served in Korea for 1 year and for the preceding 6 months had suffered intermittently from severe epigastric cramps unrelieved by anti pasmodics He had been told at other medical installations that his discomfort was not organic but he was apparently unable to accept this explanation.

When I first saw him he was hostile toward medical personnel and the type of treatment he had received. He was permitted verbally to discharge his aggression and to tell of his feelings of loneliness and lack of emotional satisfactions in his environment. As he began to feel accepted he became less tense and was able to tell about how much he missed his mother and the girl to whom he was engaged He produced a letter from his fiancee in which she related how much she missed him and he told how he had cried when he first read it When asked if his stomach had troubled him at that time he hesitated and then replied that it had He stated that the doctors he had seen had pointed out this relationship but that he had not been able to believe it. It seemed though that some letters from home did upset him An appointment was made for him to return in 1 week and he eagerly accepted this arrangement. As he arose to leave he volunteered the information that he didn t believe in this in the mind business but that he did feel better

He was seen periodically for 5 months including one 3-day period when he had to be admitted to the hospital because of an acute recurrence of symptoms precipitated by the nonreceipt of letters during a 2 week period. A limited degree of understanding of the emotional nature of his difficulty was obtained by the patient, as shown by his increasing ability to connect the receipt of emotionally painful letters—or lack of them—with the recurrence of his epigastric distress He was well motivated to the extent that he verbalized strongly a desire to

complete his service in Korea. He was early brought to recognize that his symptoms could not be used to secure his evacuation, and this, along with the emotional support I gave him, enabled him to complete his Korean service satisfactorily. The additional understanding of the nature of his symptoms developed during this relationship gave him a degree of insight into their cause, although insight therapy, as such, was not attempted because of his immaturity.

Comment. The admission of this patient to the hospital on one occasion constituted environmental modification through my direct action, but the predominant casework method used was psychologic support with the increasing use of clarification. Whenever this patient met reverses in his environment, he would request an appointment and talk freely about his situation and his symptoms. I accepted his feelings of dependency, but toward the conclusion of every interview there would be a discussion of the reality situation" and the strengths which the patient could mobilize to meet it. Appointments continued on a weekly basis until his symptoms were in remission. This support enabled the patient to function on his job in Korea, as well as helping him view his gastric upsets in their proper perspective. There was no real change in the severity or frequency of his symptoms, but the psychologic support given him and the clarification he received as to the cause of his difficulty enabled him to accept and live with his symptoms.

CONCLUSION

The function of the social caseworker in a psychiatric setting in a combat zone is essentially the same as that in other medical settings. The duties of intake, orientation, interpretation, case work, training of staff members and research which have been described are important in every setting and are familiar functions for all social workers.

There are but few differences in the technics and methods of casework practiced in the combat area as contrasted with other locales. As shown in the case presentations, the patients' problems were dealt with much more directly than usually is possible in a civilian setting. This change in technic resulted only partly from the heavy case load, but mostly from the fact that patients responded better to this approach. Subsequent experience in Japan has indicated, however, that this change is effective only in an emergency milieu. Another change in technic was the increased use of strong suggestion. The success of this change also was related closely to the group dynamics operating in combat as well as the heightened suggestibility of anxiety filled patients.

The analysis of the casework methods used in the 2 patients here described indicates but little departure from those used by caseworkers in the treatment of marital problems in a civilian setting The generally more rapid and dramatic response of patients to treatment resulted in some condensation in the use of the various methods however

The professional activities which have been described are but manifestations of basic social work philosophy in action In World War II military psychiatrists learned that "under sufficient stress any individual may show failure of adaptation evidenced in symptoms characteristic of mental and emotional disorder (3) The experience of the Korean conflict had led to another observation which is a positive corollary to the previous finding That corollary is that persons who have had earlier unfavorable adaptations can function adequately in stressful environments if those environments contain sufficient emotional support for them We frequently had the heart-warming experience of interviewing epileptic patients patients with extensive periods of psychiatric hospitalization in civil life or patients with histories of repeated juvenile delinquency who had been evacuated for exhaustion only after many months of excellent combat service and the grossest precipitating trauma These observations confirm the social worker s basic philosophy concerning the adaptiveness of the human personality, the dignity and the worth of individuals

The ego-supporting factors present in groups in emergency settings produce a milieu in which the techniics and methods of casework are particularly effective in helping patients adjust more adequately to their environments This postulate should be tested further by caseworkers in disaster areas or at other places in which the brutally overwhelming nature of reality is comparable to that of a combat zone in its meaning to the patient.

(3) Hodges M B (edit) Social Work Year Book 1951 American Association of Social Workers New York, N Y 1951 p 464

THE VASOMOTOR RHINITIS SYNDROME

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WHAT people in all types of life refer to as "catarrh" or "sinus headache" produces in the Armed Services a serious medical problem The widespread morbidity resulting from this condition puts it on a par with the common cold Its unique feature is its variation in response to environmental factors A military life which frequently brings forced changes in climate, and in living, working, and family conditions can accentuate these factors and their clinical effects Even when limited to the upper respiratory tree, the clinical findings associated with vasomotor disturbance are extremely variable Eliminating the suppurative sinus diseases, the syndrome is still complex To bring out most of the symptoms, detailed questioning is both necessary and profitable Individually, some of the symptoms seem so trivial or unrelated that they may be overlooked When grouped together, the symptoms form a syndrome the evaluation of which leads to the correct diagnosis

DIAGNOSIS

Listed in their relative order of frequency and importance to the patient are the following items

Mucous drip Most patients learn to live with their postnasal drip because it is so mild, so commonly present, and produces more annoyance than disability Often there is a constant hawking or gagging which in the early morning occasionally produces vomiting of breakfast The drip is not always mild Occasionally it is a profuse nasal mucoid discharge that will soak up 3 or 4 handkerchiefs a day Among children there are perennial "sniffers" and "dribblers" whose head colds recur in rapid succession Too many of these children have their troubles incorrectly blamed on their adenoids or tonsils Their adenoid facies and nasal twang are incorrectly offered as indications for tonsillectomy and adenoidectomy without thought to further differential diagnosis

Pain, to the patient, is the most disturbing symptom and the one most likely to cause disability Its location may vary but it is usually frontal, low (almost nasal), and bilateral or midline,

(1) Tokyo Army Hospital and Camp Drake Otolaryngologist Far East Command

radiating to the temples or occiput It is dull heavy occasionally throbbing in character and may occur daily or 2 or 3 times weekly recurring about the same time each day—more commonly in the late morning and usually lasting from 2 to 4 hours with or without aspirin The pathogenesis of this pain is obscure but is most frequently ascribed to the irritation of sensory nerves accompanying the blood vessels in the turgescent conchal or sinus mucosa Williams *(2)* asserted that uncomplicated chronic suppurative sinusitis is a painless disease The association of pain with nonsuppurative disease is so constant that its very presence is pathognomonic. One of the chief purposes of this article is to emphasize the organic basis of this symptom even though objective evidence may not be obvious Diagnosing a headache as psychogenic simply because there are no visible pathologic findings is dangerous and yet we cannot afford to lose sight of the fact that situational maladjustments and emo tional factors can produce functional aggravation

Nasal obstruction is intermittent and insidious and seldom acute or overwhelming unless a specific allergy is superimposed It is most always unilateral alternating from side to side When it constantly involves only one side or is bilateral a complicating deviation of the septum or nasal polyps must be sought

Sinusitis The feeling of a constant or constantly recurring head cold is the chief basis for the patient s insistent belief that he has sinusitis—even when the roentgenographic findings are normal The presence of headaches increases this belief The nasal reaction in these head colds may consist of (1) a feeling of dryness and stuffiness (2) postnasal drip or (3) profuse nasal discharge Transillumination in uncomplicated cases is invariably clear but roentgenograms are more revealing About 20 percent of sinus films will show a slight haziness due to mucosal thickening Consistent clearness or the return of mucous flakes on diagnostic maxillary sinus irrigation will prove this to be a nonsuppurative sinus reaction Only in severe complicated cases is polypoid degeneration seen

Dizziness is not a true vertigo, but rather a momentary light headedness It is associated with a change in position usually on stooping or rising Along with headaches this symptom is usually aggravated in muggy summer weather or when the patient gets hot Frequently he complains of blacking out but careful questioning will reveal a feeling that he is about to black out rather than actual fainting

Blurred vision No ocular changes are caused by rhinitis but pressure sensations about the eyes and transient blurring recur with active use of the eyes in reading or sewing This is often misinterpreted as eye strain by the patient

(2) William H L Allergy in A h Otolary g 56 24-44 July 195-

Globus hystericus When present, the feeling of a lump in the throat is more intense than the sensation of postnasal drip The tightness, the muscular spasm, and the feeling of constant irritation deep in the throat may lead to a choked feeling Frequently associated with this symptom is a history of shortness of breath, palpitation, or anxiety Carcinophobia is often a by product of this complaint A distinction must be made between this symptom and cricopharyngeal spasm which is very low in in the neck

Anxiety state All of the personal and family tensions which are possible in everyday life are aggravated by wartime conditions Separations from families, alerts for overseas duty, combat duty, unpleasant or dangerous assignments, or even boring, repetitious duties create strains that are easily manifested in the vasomotor system These conflicts frustrations, and resentments are commonly accompanied by symptoms of nasal hyperfunction In many, the primary cause for catarrh may be psychogenic *(3)* Some clinicians believe that emotional influences bring about alterations in the excitability of the autonomic nervous system Stimuli that were of a subthreshold level acquire the capacity of acting as excitants Cholinergic stimulation of the parasympathetic nerves produces the nasal bogginess and discharge characteristic of hyperfunction *(4)*

With each repetition or with the persistence of these psychic patterns the pathologic changes induced in the nasal mucosa become prolonged These, when accompanied by continued unsatisfactory personal adjustments may cause chronic nasal disease The choice of treatment in these patients is difficult. Unnecessary operations, ineffective local therapy repeated time after time, and misdirected suggestive therapy that can lead to fixation may prove disastrous and lead to the nasal cripples so helplessly enmeshed in their vicious "cycle of constant colds," their constant office visits and constant changes of physician. Proper management in the early reversible stage can lead to proper physical and mental adjustment.

Lest we become too critical of the physician, we must recall that the most common cause of neglect in the early stages is the patient s own reluctance to report for treatment. A dozen sneezes an itchy or a blocked nose and transient headaches may not be sufficiently troublesome to cause the patient to seek medical advice Even the physician sees these symptoms so commonly that it is difficult for him to take seriously the patient who does complain of actual disability

(3) F wler E P Jr N ur ge c f ctors in nasal catarrh P yche om M d. 12 105-11 Ma Apr 1950

(4) L r F L. Ot laryng l gy vasomotor rh nitis I Y ma s J B ( ) Medicin of t Y Second I 1950 J B L pincott Co., Philadelphia P 1950. pp 156-158

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(2) William H L Allergy I Arch Otolary g 56 24-44 July 19

Blocking or section of the parasympathetic ganglion produces the opposite effects shrinking and drying of the nasal mucosa with some crust formation and wide nasal passages Physical stimuli such as excessive dryness, excessive heat, excessive cold, dust, or climatic conditions can also produce autonomic dysfunction. Pathologic changes of the nose and sinuses due to such stimuli are so constant that the term "pathergy" has been suggested by Breuner for this disease Yet the restriction of the concept "allergy" to immunologic allergy as a complete explanation is still held by some

Kern found that 69 percent of his patients showed a perennial nasal syndrome as part or all of their allergic respiratory complaints He classified the condition as allergic rather than vasomotor and suggested that every such nasal syndrome, including the mildest, should always have a thorough allergic study including skin testing Treatments should include complete elimination of all allergenic factors such as wool, animals, overstuffed furniture, and dust of all types from the patient's environment, continued desensitization to all inhalant allergens to which he reacts positively, a specific diet eliminating offending foods, and a change of climate and environment when indicated The difficulty of such medical management in military medicine is obvious

I believe vasomotor rhinitis is a subclinical autonomic instability in which hyperfunction is induced by cholinergic impulses reflected in the nasal mucosa Such impulses can be instituted or aggravated by functional factors but are basically organic in their clinical manifestations

TREATMENT

The successful therapeutic regimen in vasomotor rhinitis is that which takes cognizance of the patient as a whole No one approach is adequate Medical, surgical, allergic, psychotherapeutic, local, and general therapy may be indicated separately or together Therapy must achieve both immediate palliative and long term relief

Surgery Rhinitis, per se, is a nonsurgical disease but there is no objection to any nasal or sinus operation that may be indicated by secondary or complicating nasal and paranasal pathology Indiscriminate and routine submucous resections are not advised because they fail to produce the benefits anticipated Too many nasal obstructions that are due to boggy turgescent membranes are treated by this operation, but severe obstructions or those impinging on the middle meatus must be corrected regardless of the medical factors

Nasal polyps that obstruct the airway or sinus drainage should be removed regardless of other disturbance The only question here is how far to go The prognosis for recurrence of the polyps is no contraindication but every medical means should be taken to prevent this recurrence The *type and intensity of symptoms* and the pathologic findings call for individual decisions If the nasal polyp is solitary, its removal will give relief for months or even years If the polyps are an overflow from the sinuses their roots may have to be removed Because few patients are seen with ethmoid polyps not associated with the maxillary sinusitis the Caldwell Luc operation is still the operation of choice if the condition is advanced regardless of what old fashioned label it may carry The simultaneous clearing of the ethmoid cells by upward extension through the maxillary sinus, by intranasal evisceration or by an external approach must be decided by the surgeon in accordance with his skill or training Solitary polyps within a sinus do not necessarily have to be removed

Infection calls for drainage regardless of allergy or somatization and the judgment of the surgeon will determine what operation is needed It may vary from simple puncture and irrigation of the maxillary sinus to a fairly radical extensive procedure Conservative therapy should be tried first if it can give proper ventilation and drainage and a *fair* promise of success Within certain limits cortisone and ACTH are of value in reducing polyps or preventing their recurrence The local injection of cortisone into the nasal mucosa permits the use of minimal doses and gives maximal effects but it is of more benefit in seasonal allergy than perennial rhinitis A recent report indicated that injections of 1 cc of saline solution will produce the same results as cortisone

In the Armed Forces we must consider whether the patient's condition is sufficiently reversible so that an operation will qualify him for military duty If not we must decide whether to operate to give the patient maximal benefit before separation from the service or to separate him with the recommendation that he be operated on later at a Veterans Administration facility

For those patients without complicating surgical processes management consists of (1) immediate palliative therapy, (2) long range curative or palliative therapy or (3) disposition including physical classification for future assignment if any

Palliative treatment of nasal obstruction includes the *simple* highly successful cautery of the conchas This quickly provides a nasal passage without disturbance of nasal function The type of drug used to relieve headache depends on the severity of the complaint Too many patients will tell you that they live on aspirin or the equivalent Although antihistaminic drugs have

given less relief in chronic vasomotor rhinitis than in acute allergic reactions such as hay fever, a sufficient number of patients obtain relief to warrant their therapeutic trial. The dose of pyrilbenzamine required for relief may be 400 mg or more per day. As an adjunct, ephedrine sulfate orally will not only increase the nasal shrinkage but overcome the soporific side effects of the pyrilbenzamine. The startling benefits first reported with ACTH and cortisone have not been permanent.

Another promising drug is banthine. Its demonstrated depression of parasympathetic nerves resulting from its effect on the vagus nerve suggested its use in vasomotor rhinitis. If the headache is associated with posterior cervical myalgia as in the so-called "tension" headaches, the sublingual application of a few drops of highly diluted histamine solution gives relief (7).

Long-range therapy is controversial because many techniques produce a few good results but none, including intensive regimens for allergy, consistently produce any large proportion of cures. The subclinical allergy which contributes to vasomotor instability is due to hypofunction of thyrotropic and adrenotrophic endocrines and the best drug for this condition is thyroid, given over several months in doses of maximal tolerance. It is convenient to use because it is given once daily, can be given to patients on an outpatient status with a minimum of control, and, when effective, gives dramatic relief of the headache. Banthine and ACTH could be considered under long range therapy because their ability to break a chain of sensitivity reactions will sometimes give relief for 6 months or more. Elimination diets, except at fixed posts in the United States are impractical for military personnel. Similarly, a change of climate is difficult, although desirable. On rare occasions transfers may be arranged through administrative channels. Medical channels are neither desirable or satisfactory unless the disease is disabling enough to warrant such a recommendation, in which case separation from the service should be considered. The routine therapy for allergy is effective only when environment, emotional adjustment, anxiety and climatic factors are controlled and when the allergies are specific. Tobacco should be recognized as a definite factor both in local irritation and constitutional effect. Many patients with rhinitis and bronchitis have responded to *abrupt complete* cessation of smoking.

Disposition. The question of military disposition varies with the individual patient who should be classified on the basis of his response or lack of response to therapy. If the objective findings are minimal he should be returned to duty after a minimal trial with therapeutic and psychotherapeutic measures.

(7) Seyd, H. E. M. Personal communication.

The average patient is satisfied to return to duty when it is explained to him that his symptoms are not due to any serious disease and that his condition is fairly common. He has had his symptoms long enough to know that duty will not materially affect his condition for the length of his current period at any post or in any assignment. The more severe subjective complaints without objective findings will require either some limitation of duty and extended observation or help in requesting a transfer on his *next* tour to a high dry region for a therapeutic trial. This group will most often require some psychologic help. Those with severe symptoms and/or findings of objective secondary or complicating pathology will require operation followed by limited duty.* This allows extended observation for determination of the suitability of continued military duty. Rarely will transfer to the United States from overseas be indicated although this may be a last resort particularly in patients with chronic catarrhal bronchitis, persistent laryngitis, recurrent polyposis or intractable headache.

CONCLUSION

Vasomotor rhinitis is a definite syndrome requiring recognition and treatment as an organic, potentially disabling condition amenable to therapy. Psychotherapy and allergic therapy are integral but associated parts rather than dominant parts of the treatment. The soldier with vasomotor rhinitis deserves medical care and study rather than a nonprofessional brush-off or a diagnosis of psychoneurosis merely because he presents no objective findings. Unfortunately because we cannot predict which patients have a good and which a poor prognosis, we cannot make any blanket rules for disqualifying these patients from military duty. The extremely high incidence (at least 30 percent) of the mild form of this disease among all population groups usually prevents favoritism in assignment to particular climates.

A BONE-FLAKING DEVICE[1]

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FRANCIS D O BRIEN *Major USAF (MC)*

AN apparatus for reducing bone to minute fragments for grafting procedures is desirable Meat grinders, centrifugal mixers, pencil sharpeners, and other household appliances have been used for this purpose Other machines have been designed exclusively for this function We have devised an apparatus (figs 1-4) to reduce cortical bone to fine dimensions (fig 5) and thus insure good contact between the graft and the host bone

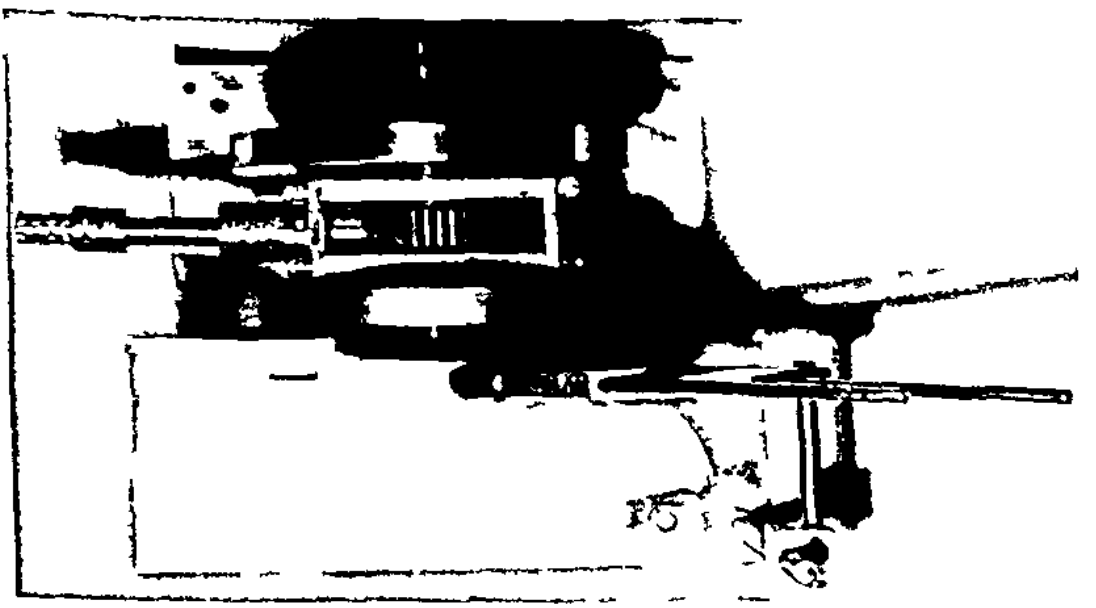
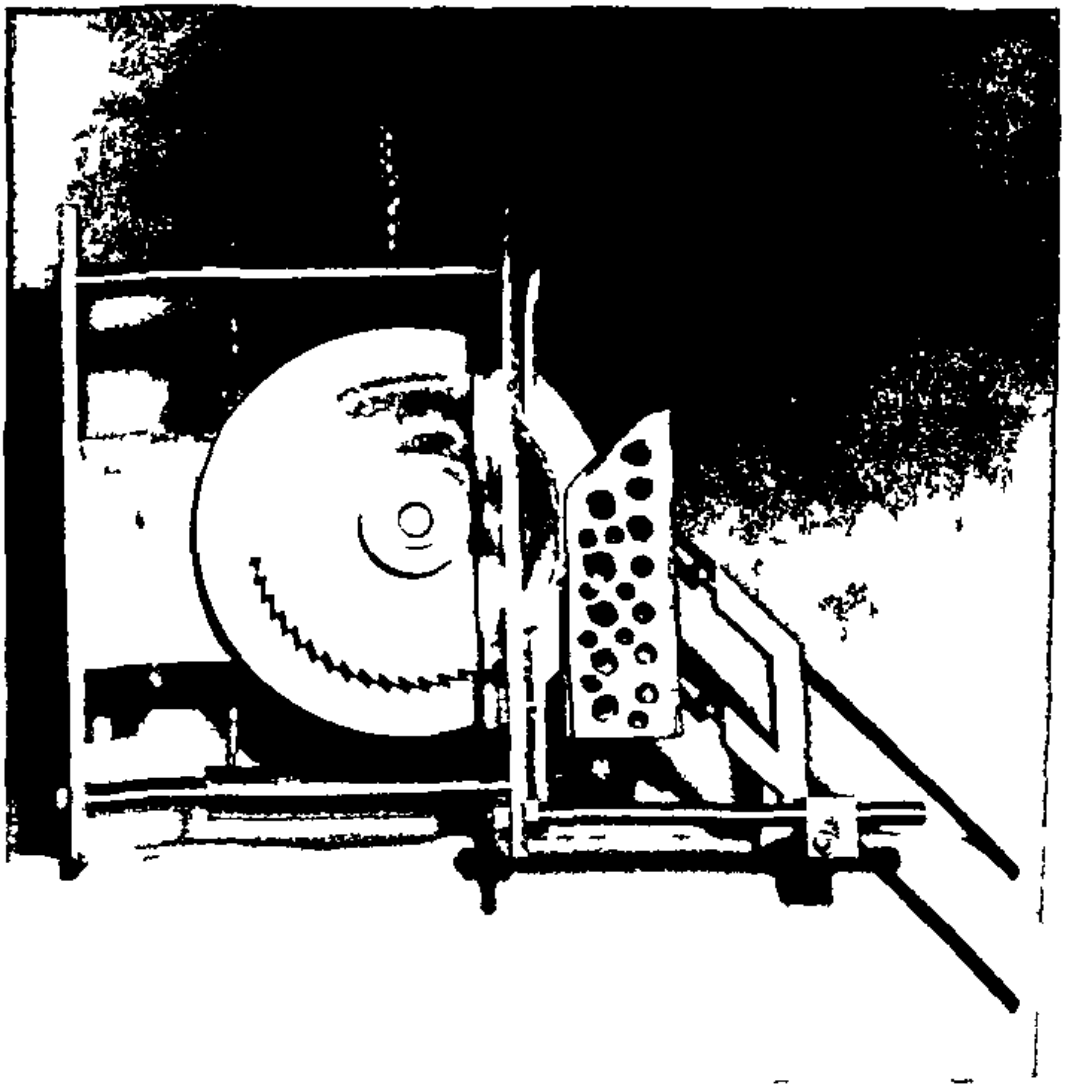


Figure 1 View of bone flaker from above with top of housing removed as for cleaning Note flywheels cutting wheel feed tube circular table saw and guard.

These bone shavings may be mixed with a solution of blood and penicillin and applied as a plastic substance in fusion operations involving cancellous bone, or as a contact substance between a cortical strip graft and the host bone We are investigating the physiologic properties of flaked bone

With our device, bone flaking is accomplished by feeding cortical strips through a tube to the cutting face of a rotating wheel

(1) U S. Air Force Hospital Maxwell Air Force Base Ala.



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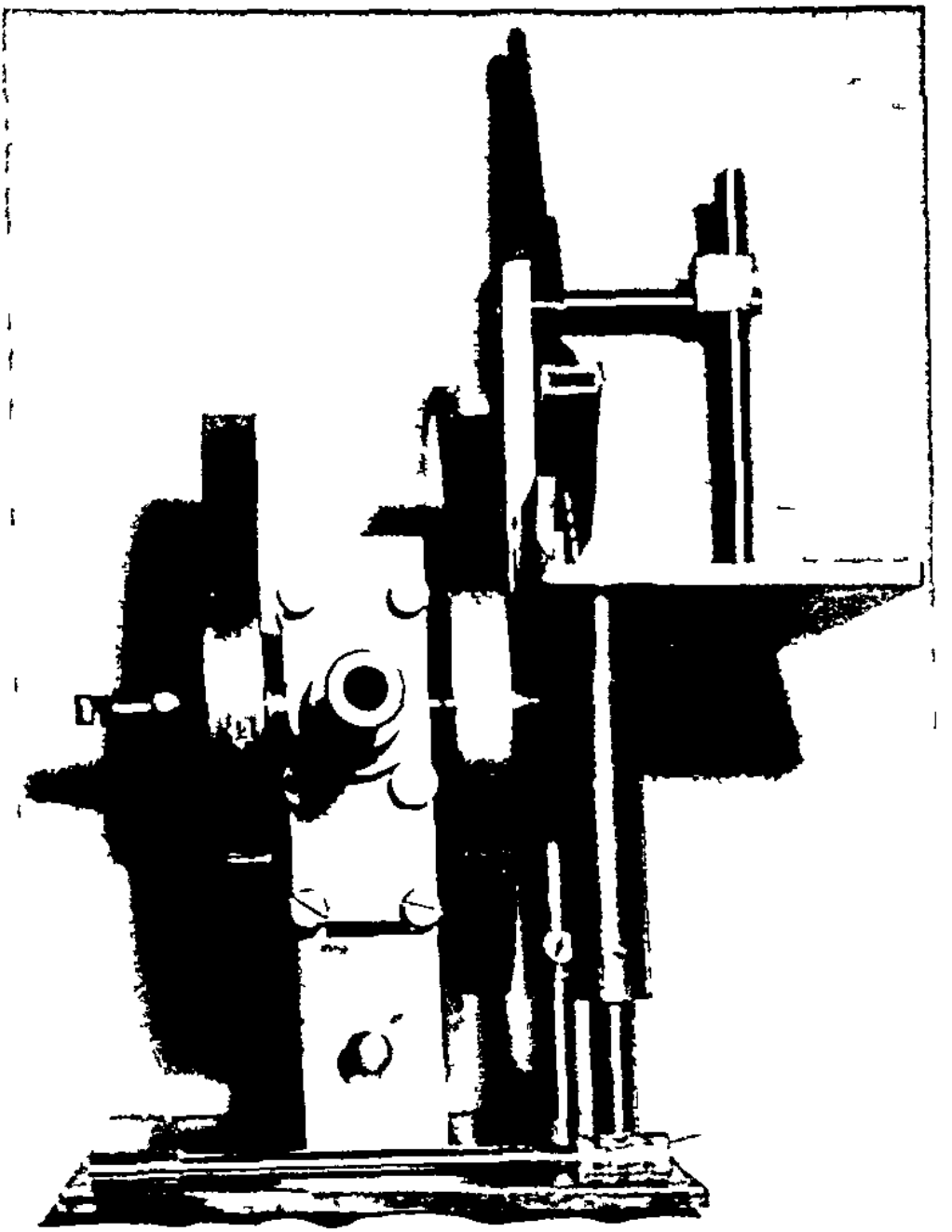


Figure 3 Front view of unit The plunger of the feed tube (½ inch in diameter) has been removed and placed on the base plate

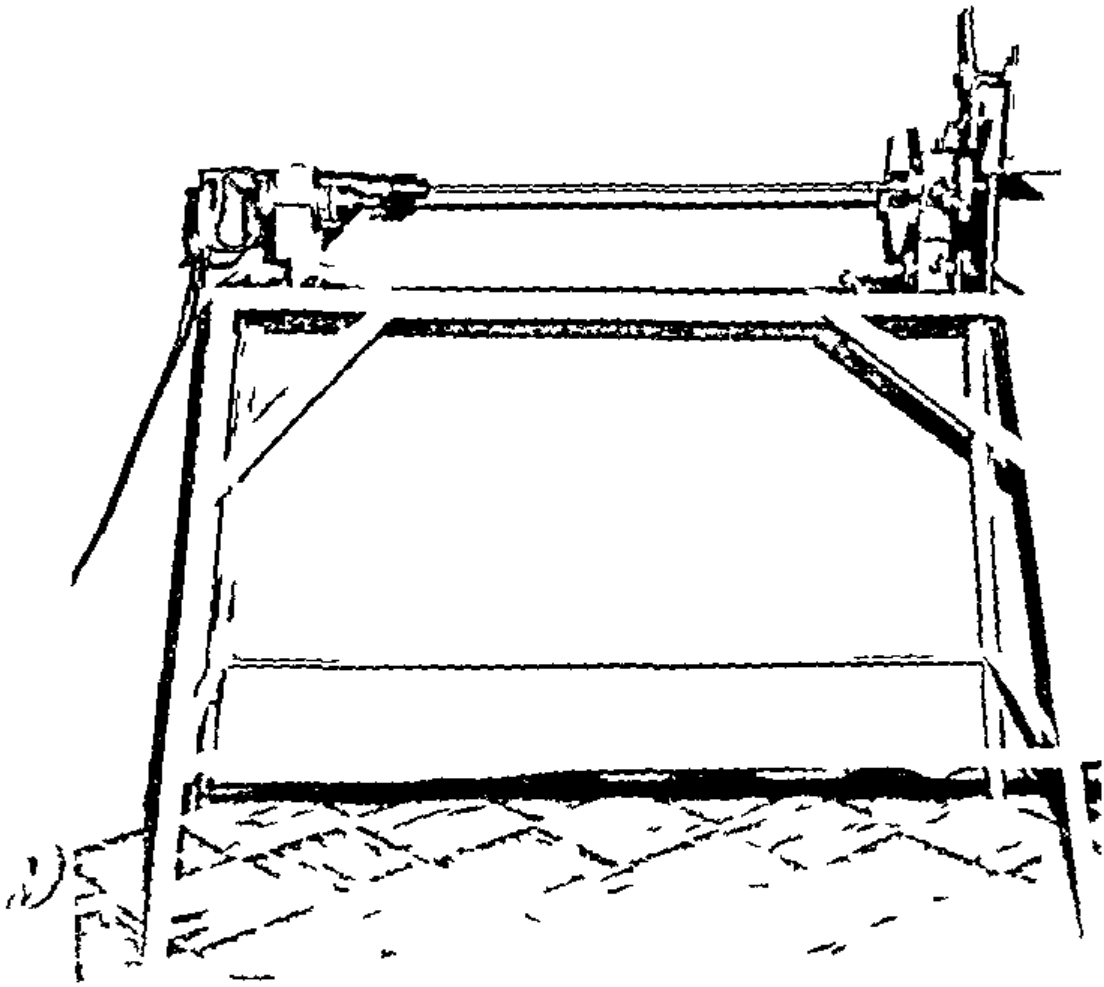


Figure 4 F ont v ew f a mbl d un t N t st dy tand f d mo t powe nit and d ive sh ft w th u ver l co pl g A tensile d ape cove s the st d wh n se

The cutting wheel is driven at 700 r p m by an unsterile hand drill turning a 30-inch sterile drive shaft Two heavy flywheels prevent stalling The outboard side of the machine drives a circular table saw which cuts the graft into strips that fit into the tube

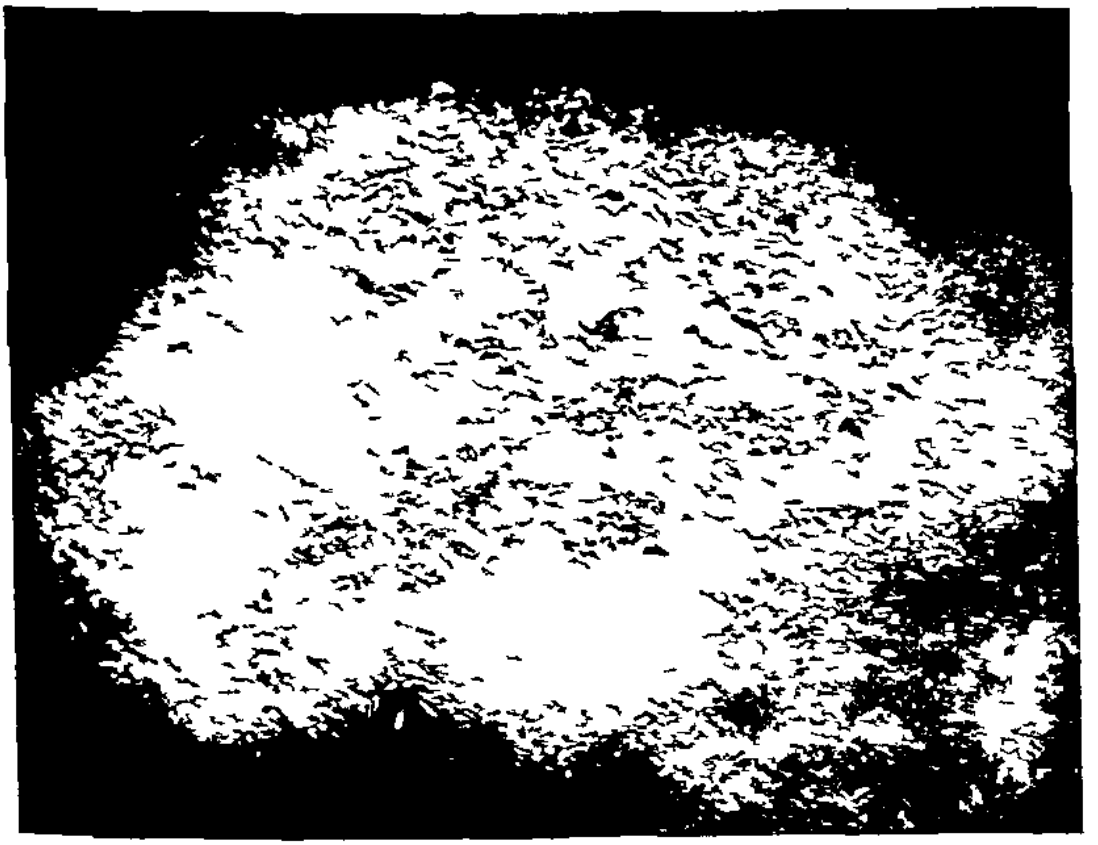


Figure 5 Specimen of fibula reduced by the bone-flaking device

The machine and drive shaft are sterilized with steam During use a sterile sheet is placed over the stand under the machine The unit weighs 25 pounds and is stable The sterile drive shaft is easily attached to the hand drill and the unit To clean the device, the top of the housing is removed and the cutting wheel washed with water followed by ether The cutting wheel and saw blade are coated with oil for storage

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ADOLESCENT KYPHOSIS

THOMAS E DAMERON Jr *Lieutenant MC USNR (1)*

WILLIAM H GULLEDGE *Commander MC USN (1)*

THE interpretation of deformities of the spine has always been a challenge to the orthopedic surgeon This article is a study of one of the most frequent thoracic deformities, adolescent kyphosis

HISTORY

In 1921 Scheuermann *(2)* first described what has come to be called adolesecnt kyphosis, Scheuermann's disease, juvenile dorsal kyphosis, and vertebral epiphysitis He suggested that the syndrome be called osteochondritis deformans juvenilis Prior to this there had been no clinical studies of this entity, although Virchow, in 1916, had given an anatomic description of anterior wedging of the thoracic vertebras in man as well as in apes

METHOD OF STUDY

One thousand young men were examined in the order of their reporting for duty at this recruit training center Of these, we found 83 who had significant dorsal kyphosis which could not be corrected by active or passive attempt These men were then studied more closely with complete history, physical examination, and lateral roentgenograms of the thoracic and lumbar vertebras Twenty two of these men did *not* show vertebral changes sufficient to justify a diagnosis of adolescent kyphosis They were, therefore, considered as a control group Our roentgenographic criteria for a diagnosis of adolescent kyphosis were (1) anterior wedging of 2 or more thoracic vertebras, (2) increased anteroposterior diameter of the affected vertebras, and (3) irregularity of the adjacent vertebral surfaces

CLASSICAL SYNDROME

Adolescent kyphosis is a deformity of the thoracic spine occurring in adolescents as a result of a disturbance in vertebral growth Eighty-eight percent in Scheuermann's series were male, and later authors have found from 70 to 90 percent of those affected to be male Characteristically the affected patient is in

(1) U S Naval Hospital Bainbridge Md

(2) Scheuermann V H Kyphosis dorsalis juvenilis Ztschr f orthop Chir 41 305-317 1921

good general health and has normally developed musculature of the back There may be pain in the area of the kyphosis for a few weeks early in the course of the disease Rarely is it accompanied by local tenderness or muscular spasm The cosmetic deformity noticed by relatives or friends is the most frequent complaint Calve *(3)* listed the only sequelas of the disease as the disfigurement and the compensatory lumbosacral lordosis which may cause pain

Scheuermann found that farm boys were most frequently affected Later authors have reported a high incidence in the lower economic groups We found no difference in incidence in any economic group

The sixth through the tenth thoracic vertebras are involved most frequently Early in the disease the only roentgenographic change to be seen is an anterior wedging of these vertebras Later the opposing surfaces of the vertebras become irregular and there is a horizontal lengthening of the vertebral bodies Frequently there is narrowing of the intervertebral spaces with sclerosis and mottling of the adjacent vertebral surfaces Schmorls nodules are frequent There is never any other bony destruction or rarefaction

NORMAL VERTEBRAL GROWTH AND DEVELOPMENT

During the fifth to ninth week of embryonal life each vertebra is formed from the caudal half of one provertebra and the cephalic half of the provertebra below it By the twelfth week the vertebra is well formed in cartilage At 15 weeks ossification begins in the center of the vertebral body and in each of the lateral vertebral arches Three weeks later these centers are consolidated into one osseous mass

Plates of columnar ossifying cartilage similar to those of epiphyseal lines elsewhere are present at the caudal and cephalic surfaces of the ossification center after 21 weeks It is in these areas that vertebral growth takes place After the age of 6 years there is a period of quiescence in vertebral growth until puberty At this time calcification appears at the anterosuperior and anteroinferior vertebral margins These develop into bilateral convex bony plates within the substance of the cartilage of the superior and inferior surfaces of the vertebra

These subchondral bone plates lie outside of the true epiphyseal cartilaginous plates and apparently do not contribute to the growth of the vertebra Because the anterior longitudinal ligament inserts into these bone plates they have been called vertebral ring apophyses Anatomically and etymologically the more pre

(3) Calvé J T time f d le kyphosis Br M. J 2 983 985 De 1 1934

cise term is vertebral ring epiphysis There is disagreement as to the age at which these epiphyses unite with the vertebral body Some authors report union at the age of 18 and others as late as 24 years We have seen vertebras which were completely fused at 17 and others which were not completely fused at 21

ETIOLOGY

Adolescent kyphosis is usually placed in that large group of diseases of uncertain cause known as the osteochondritides For one or more reasons rickets, endocrine dyscrasias, dietary insufficiencies, low grade infections, tuberculosis, selective trauma, and selective emboli have all come into disfavor as the etiologic agent The 2 most widely accepted theories are those of Schmorl (4) and Ferguson (5). Schmorl showed that overloading the spine could cause a flattening of the intervertebral disks with herniations into the cartilage of the vertebral body He did not think that the epiphysis contributed to the growth of the vertebra but that it acted as a cushion between the disk and the vertebral body He stated that small hernias of the disk into the cartilaginous plates are not always pathologic but, if large enough or sufficiently traumatized, may result in an interference with the subchondral ossification and hence the growth of the vertebra anteriorly The articular facets protect the vertebra from compression posteriorly Ferguson stated that the vascular groove at the center of the anterior border of the vertebra normally disappears at the age of 5 or 6 years Persistence past this age results in an anteriorly weakened vertebra which can be compressed by static forces In our series, 3 of the 22 controls showed anterior notching of 1 or more vertebras and only 6 out of the remaining 61 with anterior wedging had a persistence of the vascular groove

TREATMENT

The generally recommended therapy is support of the spine by casts, braces, or bed rest to prevent accentuation of the kyphosis Reported results have been inconclusive No treatment is indicated after vertebral growth has stopped

ANALYSIS OF FINDINGS

None of our series of 1 000 men had any tenderness or muscle spasm Their ages ranged from 17 to 23 years (average 18½) There was no predilection for any race, vocation, or geographic area Three of the controls (13 percent) had a history of back trauma, whereas only 4 of those with adolescent kyphosis (6

(4) Schmorl G Zur Kenntnis der Wirbelkorperepiphysenlockerung und der ihr entsprechenden Wirbelkrankheiten Roentgen Arch f klin Chir 153 35 45 1928

(5) Ferguson A B Roentgen Diagnosis of the Extremities and Spine 2d edition Paul B Hoeber New York N Y 1949

percent) gave such a history Over half of those affected did not know that they had any abnormal curvature until our examination Only 1 patient had any symptoms referable to his kyphos His was one of the more pronounced deformities He had had a mild aching pain in the back for 6 months but this subsided after 2 months of naval training and was never severe enough to cause him to seek medical attention Seven patients with adolescent kyphosis gave a history of mild, intermittent, low back pain A corresponding per cent of those not so affected gave a similar history The incidence of adolescent kyphosis in our series (6 1 percent) corresponds closely with that (6 percent) found by Fletcher (6)

TABLE 1 *S mmary / / nd gs t 83 m w th do l kyp/ i*

	C nt l gro p (22)	Ad l t kypl l gt p (61)
A g g (yr)	20 3	18 4
A r ge h ght ( )	68 5	69 8
A g w ght (lb)	154	158
Symptoms		
Lumbar	3 (14%)	7 (12%)
Thor ic	0 (0%)	1 (2%)
Hi tory of tr uma	3 (14%)	4 (7)
Oc pa on		
Labor	12 (54%)	34 (54%)
Cl k	4 (18%)	15 (24%)
Stude t	2 (9%)	8 (13)
Farme	4 (18%)	4 (7%)
Int rv rt br l		
narr w g	5 (23%)	55 (90%)
Sl gh	4 (18%)	27 (44%)
Mod rat	1 (5%)	20 (33%)
Marked	0 (0%)	8 (13%)
Schmorl od le	5 (23%)	49 (70%)
L fes d p by is	4 (18%)	8 (13%)
Ce r l or bu g f or r t bral bor r	3 (14%)	6 (10%)

Average heig of ese group of 1 000 or r mber of me

The roe_ge_ograms were of the most valne to us in our _tudy We found the seve_th thoracic vertebra to be the most frequently involved with the incide_ce of involve_e_t decreasing pro_gre sively above a_d below this level No vertebra above the th r

(6) Fle_cher G h_ Anterior vertebral wedging_ther_ency ad _ndicance Am J Roentgenol 5 23%-3_ F 194

or below the twelfth thoracic was involved in any subject The average number of vertebras involved was 4 5 There were no men with an associated scoliosis Intervertebral narrowing and Schmorl's nodules were found in the controls but the incidence of each was nearly 4 times as great in those with adolescent kyphosis The findings are summarized in table 1

SUMMARY

Adolescent kyphosis is a benign condition of unknown cause which shows a predilection for the sixth through the tenth thoracic vertebras of adolescents and results in anterior vertebral wedging Those affected are usually healthy young men with good back musculature We know of no predisposing cause With the present knowledge of this condition, adolescent kyphosis is, we believe, the most descriptive name The deformity was found in 61 of 1,000 healthy young men The diagnosis can be confirmed only by means of lateral roentgenograms of the thoracic spine Those in whom we made a diagnosis of adolescent kyphosis did not have any more complaints than did the control group

BOOK REVIEW

Pain Sensations and Reactions by *James D Hardy* Ph D Associate Professor of Physiology Cornell University Medical College *Harold G Wolff* M D Professor of Medicine (Neurology) Cornell University Medical College and *Helen Goodell* B S Research Fellow in Medicine Cornell University Medical College With a Foreword by *Edwin G Boring* Ph D Professor of Psychology Harvard University 435 pages illustrated The Williams & Wilkins Co Baltimore Md publishers 1952 Price $6 50

Pain is one of the most important problems in medicine Patients demand that the physician relieve their pain The control of pain has enabled more intensive treatment of disease and access to diseased organs by the surgeon The multitudinous methods and drugs used for this purpose also point up the lack of knowledge of what pain is, its precise pathways, and the psychobiologic effects

This book attempts to answer some of the fundamental questions about pain It includes the experimental researches on pain by the authors in the last 13 years One of their major contributions was the development of the dolorimeter which is well described in the chapter on methods for the study of pain thresholds With this instrument the intensity of pain can be measured A scale of "dols" in 10 equal steps was devised to measure the

levels of stimulus intensity from threshold to ceiling One stim ulus is related to another and the scale is one of equal intervals of felt pain How great pain is under different disease condi tions can be determined with some quantification Also the method lends itself to a quantitative and objective appraisal of pain relief measures Whether any instrument can be devised to measure pain in human beings with all the psychologic factors at play is highly improbable but the measurement of pain in terms of stimulus intensity is a great achievement

The value of the experiments reported is increa ed by a round ed view of the subject of pain sensation There are chapters on the development of the various concepts of pain the form and functions of structures subserving pain methods for the study of pain reactions to pain, the effect of analgesics, pain sensa tions as affected by cerebral damage, and painas an experience The authors have used whatever contributions physics neuro-physiology psychology surgery, medicine neurology psychia try and other scientific fields could offer

They believe that pain is aroused by noxious stimulation which in the body is tissue destruction Emotions and attitudes are identified reactions to pain Pain is also a sensation and as such is mediated by specialized neural equipment The average normal person begins to feel thermal pain when the heat of the skin reaches about 220 millicalories per square centi meter per second This perception of pain is fairly uniform but the tolerance varies greatly and is influenced by many psycho-logic factors

The problem of pain is presented historically and experi mentally In the breakdown of the various aspects of pain clini cal applications are suggested A separate consideration of the treatment of all types of pain is not within the scope of this book It is concerned with the fundamental aspects of pain There are 505 references to the literature

—Lt Col R C Greenwood MC USA

REPAIR OF TRAUMATIC FINGER TIP AMPUTATIONS

JOHN L. HOLMES *Captain USAF (MC) (1)*

TRAUMATIC finger tip amputations are minor injuries but are important because they affect grasping and stereognosis The hand might be considered as a device to enable the finger tips to perform these functions Traumatic finger tip amputations are not uncommon It has been estimated that about one third of all industrial accidents involve the hand and that many of these involve the finger tips *(2)* Many of the amputations are of the guillotine type through the fingernail and distal phalanx It is this common type that presents the greatest concern over the choice of treatment

The choice of the many methods of repair of traumatic finger tip amputations is limited by many factors Some of the more important are (1) the type of amputation (guillotine or oblique), (2) the amount of crushing, (3) elapsed time after injury, (4) concomitant injuries such as multiple compound fractures of the hand and loss of palmar skin, (5) general condition of the patient, (6) age of the patient, (7) the type of work which the patient performs, (8) the patient's psychologic make up including fear of operation or "compensationitis" (9) the finger involved, (10) the available surgical facilities and (11) the skill and patience of the surgeon

Any choice of repair should seek to maintain (1) discrete stereognosis, (2) tough skin texture (3) subcutaneous fat padding, not excessively thick or thin and (4) the length of the finger, including, if possible an undamaged nail bed The use of the finger tip for forceful and delicate apposition depends on all of these, but particularly on the stability offered by skin of tough, semi inelastic texture, without excessive underlying fat A good cosmetic result should be of secondary interest except in the patient whose occupation requires it

The methods of repair include (1) granulation, (2) reamputation, (3) local revision, (4) skin grafting, and (5) replacement of the original tip All except proximal reamputation succeed in keeping, or adding, length and saving the fingernail

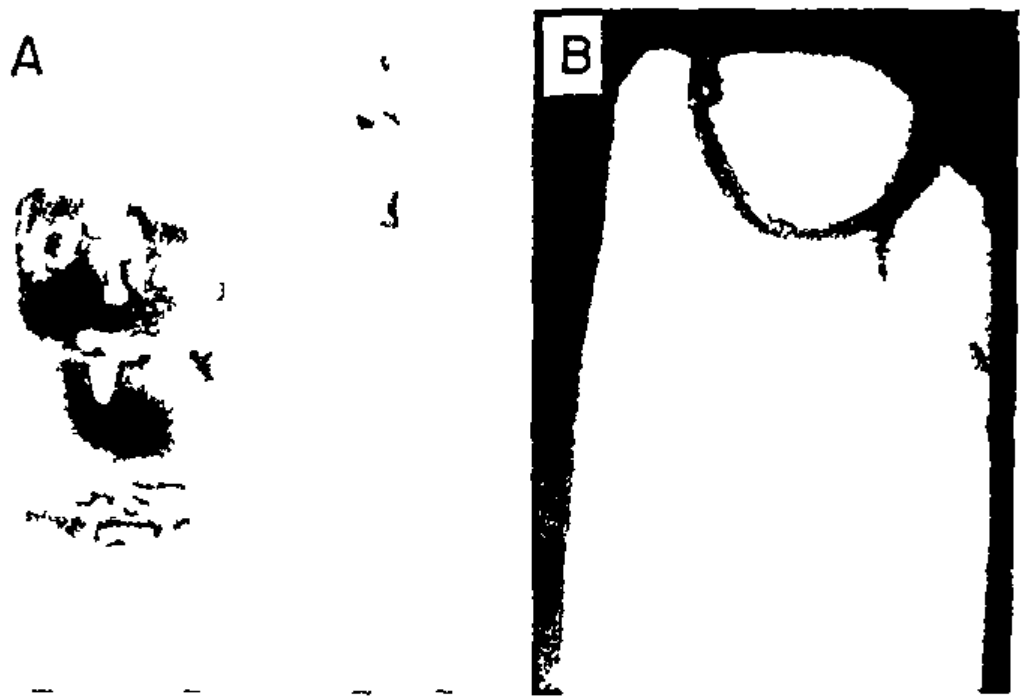
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(1) 5005th U S A Fo Hosp t l Grou

(2) Jo R A. Method for cl ng tr ma c def f f nger t p Am. J Surg 55 326 338 F b. 1942

Granulation In the past 10 years, many authors *(3–6)* condemned this method though it may be the commonest method of treatment One report stated that this method when used with spiral tape wrappings is superior in its "simplicity lack of expense or time lost and in the end result" *(7)* Many patients may be seen too late for other methods of treatment

The end of the finger consists *functionally* of the distal surface and the ventral surface The average worker has few repeated functional demands on the extreme distal surface of the finger as compared with the slightly more proximal edge of the finger with the exception of the thumb In healing by the granulation method the ventral edge of skin and subcutaneous tissue of the



F gur 1 Pb t gr phs 14 b f llow g avul o of uddle f g N te mpl t lo f d tal and pa t al loss of ntral fac (A) V t l sew (B) D al w

guillotine stump slips forward from external pressure on the skin edge and from cicatricial contraction This edge moves dorsally as well as distally fashioning a new ventral tip out of skin and the subcutaneous fat cushion The outgrowing nail arches gently

(3) Temp t M N Cr finge flap t ea m f injur f g p Pla & R truct Surg 9 205 222 Ma 1952
(4) Ball g F P Fing p pa U S Armed For M J 3 561 564 Apr 1952
(5) W b er G V T ea me f f g p mputat P grad M d. 8 416-419 N 1950
(6) M Ca ll H R Imm d ppl ca f fr f ll h ck ki gr ft f tr um mp ta f f ger J Bo & J nt Surg 26 489 494 J ly 1944
(7) La W T G ll ne mp ta f f g t ps mp ov d m h d f Am J Surg 81 348 350 Ma 1951

in a ventral direction As a result, the distal surface, just beneath the outgrown nail, has poor stereognosis, inadequate padding, and a delicate, thin skin The typist or violinist, who subjects this small area to many hours of trauma daily, would require revision of the distal surface by other methods The average worker uses the ventral surface for most of his work, even in many instances where discrete apposition is required This ventral surface affords (1) nearly perfect stereognosis, (2) good padding, (3) tough, stable skin, and often (4) slight lengthening of the finger and preservation of the nail (figs 1 and 2)

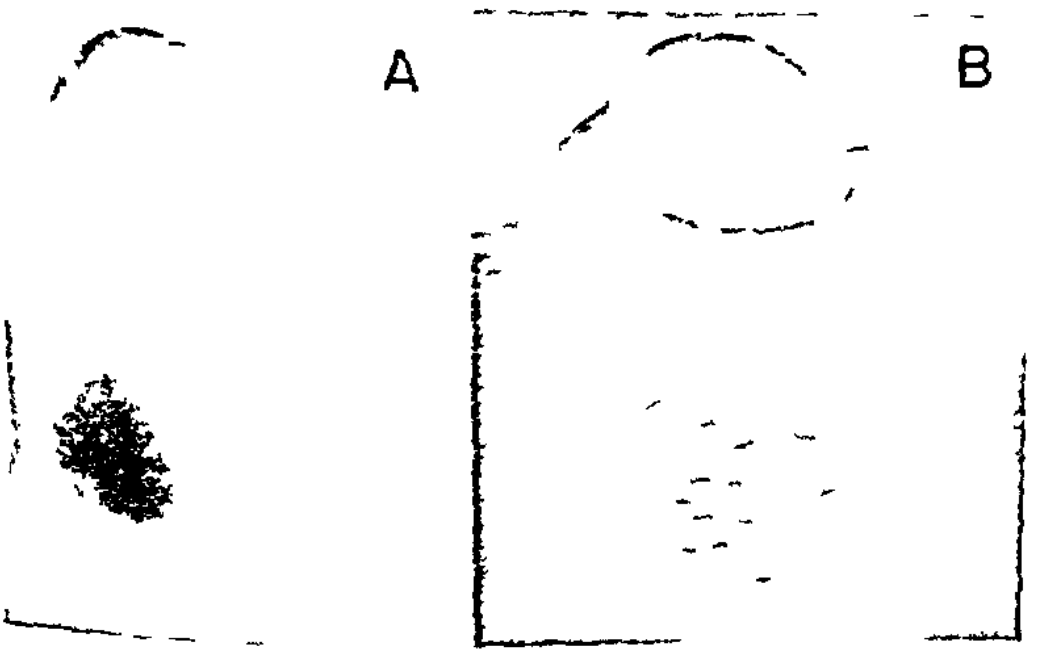


Figure 2 Photographs of finger shown in figure 1 taken 17 weeks after injury Healing was by granulation. The ventral edge of the original stump has shifted toward the arched nail. Finger is free of tenderness and useful (A) Ventral view (B) Dorsal view

There are 2 objections to this method All granulating tips become grossly infected, producing a stump that is very tender during the process of healing and thereby prolonging the period of temporary disability Wounds of the hand are considered past the stage of safe debridement repair of deep structures, and closure if they are over 8 hours old *(8)* An old wound should be treated by the granulation method This method may be advisable in infants and young children because of difficulties in performing surgical procedures skillfully and in immobilization and dressing of the finger tip

Pearing operation This method should be used when an oblique stump has a ventral or lateral flap large enough to be swung around the stump end to the fingernail or to the opposite side, without destruction of the nail bed or distal interphalangeal joint

(8) Bunnell S. Surgery of the Hand 2d ed. J. B. Lippincott Co. Philadelphia 1949

Reamputation may be used and length sacrificed if the adequacy of the circulation in the finger is questionable The resulting finger tip develops nearly perfect stereognosis good padding and tough stable skin at the expense of slight shortening

Local revision This method entails the use of the lateral and ventral stump skin because the nail bed on the dorsum of the stump is usually undamaged and can be preserved Three types for use in patients with a remaining nail bed are the bi

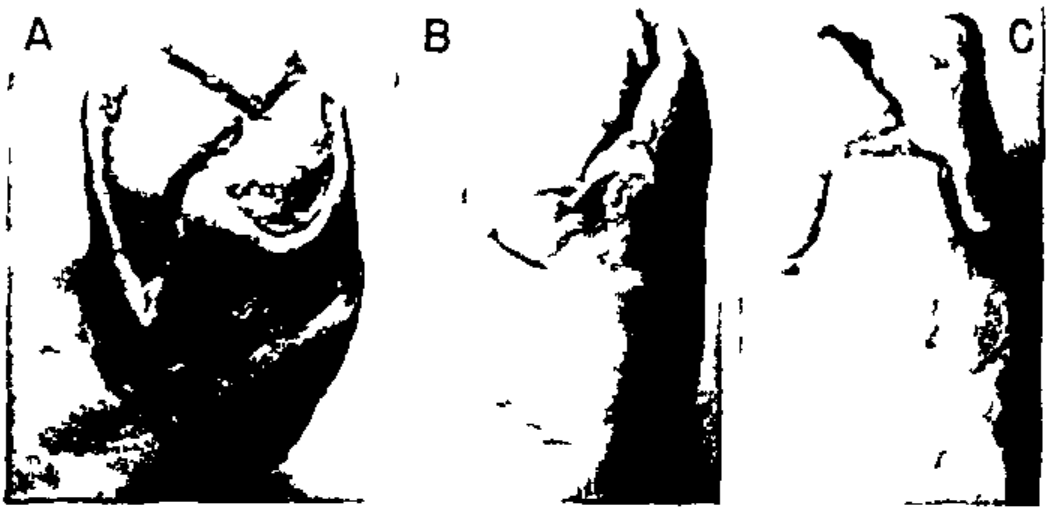


Figure 3 Photographs of clay models presenting location of incision for fingertip (A) Kutler bilateral wedge pull forward method (B) DeJongh ventral hood pull forward method (C) Lateral wedge pull forward method.

wedge pull forward method of Kutler *(9)*, the ventral hood pull forward method of DeJongh *(10)* and a lateral pull forward method (fig 3)

These procedures offer excellent stereognosis normal skin toughness and stability with only slight decrease in the padding and absence of shortening If the ventral hood is used, the ventral incision should be made far enough proximally to prevent the granulating scar from forming on the peak of the ventral surface

Skin grafts

1 *Split thickness and pinch grafts* provide a covering and spare the patient the long convalescence of the granulation method but the result is usually the same Some believe that split-thickness and pinch grafts offer much better chances of a take than the simple free full thickness graft If the surgeon s experience with full thickness technic bears this out he should use either the split-thickness or pinch graft methods but if his

(9) K l W l w m thod f l ng r p mp ta J A M. A 133 29-30 J a. 4 1947

(10) DeJ gh E. S mpl pl procedur f f g for rv ng bo y ad f m g l u pad Am. J Surg. 57 346-347 A g 1942

technic and results are as good as those of Reed and Harcourt *(11)*, who reported the loss of only 3 out of 57 free full thickness finger tip grafts, he should use free full thickness grafts because they offer tougher distal surfaces with more discrete stereognosis and with little difference in risk of failure



Figure 4 Clay model showing free full thickness graft in place

2 *Free full thickness grafts* are probably the method of choice in losses not involving bone *(11)* Because the fat pad loss is not complete, fat replacement is unnecessary The resulting finger tip meets all the desired objectives with only slight, usually insignificant, loss of total padding (fig 4)

3 *Dermatosubcutaneous, or pedicle, grafts* which use *palmar* skin offer excellent stereognosis, being richly endowed with tactile end organs, good subcutaneous padding almost identical in function to that of the normal finger tip, and skin of tough, stable, and secure texture *(2 4 12)* The use of general body surface skin results in a finger tip which lacks sufficient tactile end-organs to afford good stereognosis and is so flexible and soft that it jerks back and forth painfully and insecurely if there is enough padding to provide protection from the trauma of work When extensive skin avulsion leaves an intact distal phalanx which would require extensive removal of palmar skin, a body surface skin pedicle with a very thin layer of subcutaneous fat might be the graft of choice (fig 5) Both types of pedicles preserve finger length The cross finger pedicle graft is an intermediate, or third type, that may be used for repair of finger tip amputations, particularly the guillotine type involving bone *(3 13)* This skin is inferior to the palmar skin but superior to that

(11) Reed J V and Harcourt A. K Immediate full thickness graft to fingertip Surg Gynec & Obst 68 925 929 May 1939

(12) Gatewood Plastic repair of fingertip defects without hospitalization J A M A 97 1479 Oct 30 1926

(13) Gurdin M and Pangman W J Repair of avulsed defects of fingertips by dermal flaps Plast & Reconstr Surg 5 368 371 Apr 1950

of the general body surface in tough texture and stere
(fig 6) In the aged or arthritic patient this method may
ferred Because it lessens discomfort and enhances immo
tion it is the best pedicle graft method in the active, r
child



F gur 5 Ph tograph how g pal a ki p dicl gr ft (A) F days f t tag perat on. (B) Twe ty we ks later fter b al g s compl



F gur 6. Mod l how g a cr f ger pedicl gr ft bef o plac m t of a fr f ll- o plit th k s g aft at the d or s t

Replacement of the original finger tip may be attempted after injury if the amputated tip is perfectly intact and usually damaged The skin of the amputated tip may be u a free full thickness graft after the underlying subcutane has been removed

PSYCHIATRIC EVALUATION OF MILITARY PRISONERS

PAUL H TOLPE *Lieutenar MC USNR (1)*

CERTAIN psychiatric and medicolegal problems of military personnel confined to the various brigs administered by the Navy and the Marine Corps should be clarified and reformu lated so as to suit best the needs of the services as well as to encourage an enlightened penal philosophy The duties of the psychiatrist attached to a brig have been for the most part limited to the determination of mental competency and the ability, in a psychologic sense, of the accused to stand trial and the rigors of confinement In general, only psychotics fall into the group for which a negative decision is made, although there are ex ceptions In addition, however, the brig psychiatrist can perform certain functions which will help to maintain good standards of performance of military personnel and to reduce the bri_ census

Unauthorized absences account for most confinements to naval brigs Probably less than 5 percent are confined for other rea sons

The dictionary defines a symptom as "any functional evidence of disease or of a patient's condition, a change in a patient's condition indicative of some bodily or mental state " A sign is "any objective evidence of disease " If laws are not found gen erally to cause much hardship to most persons who must obey them, then breaking the law is, in a psychologic sense, a symp tom (using "symptom" less strictly as subsuming both symptom and sign) The symptom breaking the law, however, as it is mani fested in the purely military offense of unauthorized absence (that is, an offense which is nonexistant in civil life) is not specific enough to point immediately to any one underlying cause In psychiatric conditions the causes may be multiple and not so clear cut as they sometimes are in organic conditions

It is now commonly believed that a man's adult psychologic structure is based on constitutional predisposition plus life experiences—nature and nurture The most powerful life ex periences occur at an early age A person then has no choice concerning the basic determinants of his future personality This does not mean that there are no decisions to be made

(1) U S Na l Tra ng C ter G t Lak s Ill

at any time by an adult personality and that one s path is completely predetermined in childhood but it does mean that the adult s choice of conduct will of necessity fall into certain large predetermined categories So for example given a sense of injustice derived from early infantile experiences one man because of his background, will tend actively to better the lot of himself and of others in a socially constructive way while another man of a different background will actively strive to remedy injustice in a socially destructive way What he does, however is not only the result of rational thinking but is derived from what he has learned are for him existing and allowable choices of conduct and are choices which he is capable of executing The general pattern of a man s behavior and his basic capabilities do not change much during a lifetime except perhaps in superficial ways Some men are less capable of conforming constantly to established codes of adult conduct than are others This may not always be because of a need to defy the law but may occur as an accidental secondary accompaniment of other psychologic disturbances This is well recognized in the case of psychotic persons It is customary to concede that the psychotic s psychologic disturbance is so great as to render him incapable of conforming to accepted standards of conduct When such persons commit an offense they are released to the medical department for treatment and disposition Disciplinary action is waived It is not so clearly recognized however, that the *nonpsychotic person* may also be psychologically ill even though the gross immediately apparent symptoms of mental illness are not present

The Navy and Marine Corps are a very special branch of society They have certain special standards to meet their specialized nature These are rigidly outlined in relation to the physical standards for induction They are not so clearly set forth in regard to his psychologic qualifications One reason for this is the great difficulty except in certain extreme cases, of making a prediction as to a man s ability to adjust to a new environment The only certain test of this ability is exposure to the new environment Some men who have adjusted reasonably well to civil life cannot adjust in a military environment There are many reasons for this One is the relatively narrow range of social conditions that exist in the military services as compared with the great latitude of social conditions that exist in civilian society In civil life one can find one s level and remain there In the military service this is not so One is pressed into a relatively regimented society where one must get along with relatively large numbers of people and be separated from with whom one has had strong emotional ties One must be even in time of peace periodically to adjust quickly to living conditions Some persons are not capable of adjusting

what is to them a great disruption of their hard worn and perhaps unhealthy emotional balance

The latently psychotic person reacts to these fresh demands on his unstable psychologic structure by a massive withdrawal of interest from the fearful social conditions He lives more and more within himself until finally his behavior, attuned only to his own preoccupations and to misinterpretations of what exists outside of himself, becomes sufficiently bizarre to come to the attention of the authorities During his psychotic state the mentally ill man may violate a military law by an unauthorized absence The offense is a chance accompaniment of the illness and may even have been an attempt at self treatment—treatment aimed at avoiding the fearful situation Other persons, finding themselves in a situation in which they are incapable of adjusting, react in different, nonpsychotic, but nevertheless inadequate ways They are classified as psychoneurotics or more frequently as having character and behavior disorders They may not manifest the queer ideas and motor activities of the psychotic person On the other hand, their reactions may differ from those of well adjusted persons only in intensity, degree of tolerance to stress, and ability to control immediate, personal needs

Thus, although anger toward a disliked authoritarian figure might in a well adjusted person result in integrated, planned action to make the situation more tolerable, or resignation to the temporary frustration, or channeling of anger into acceptable activities which would not call for direct action against the authority, the immature, impulsive, uncontrolled man will often act in ways that will call forth a violent response in the authority toward the man, and a cycle of acting out, punishment, acting out, et cetera, is initiated Another exaggerated response to the new frustrating situation is that of the covertly quite dependent person who, finding himself away from the complex supporting relationships of home, becomes extremely nostalgic, sleepless, tearful, and inconsolable A more complicated but similar reaction is that of the immature man who shortly after coming into the service, marries hastily—apparently to fix firmly his dependent ties with home If he then learns that his equally immature wife has been unfaithful or is no longer interested in him, he may impulsively absent himself without leave and return to home, wife, or mother Sometimes a satisfactory adjustment is made, sometimes not Often a kind of regression occurs and the latently immature man becomes even less mature and openly dependent and continues to absent himself to be home in familiar childhood surroundings without which he is chronically incapable of sustained minimally useful activity

Though the surface indications of these severe character and behavior disorders may often be obnoxious and anger producing

in the observer they are the result of a relatively severe psychologic disturbance Symptoms of psychologic disease are often like the symptoms of organic disease not apparent as such to the lay person and certainly in psychiatry as in other branches of medicine the manifestness of a symptom from a lay viewpoint is not the only indication of its severity, importance or underlying hidden crippling effects

It is one of the problems of the brig psychiatrist to determine which men are capable of adjusting to the military service reasonably well so that their tour of duty will be marked by generally sustained useful productive work and which men because of their psychologically pathologic structure will be incapable of this and will be chronic psychiatric and/or disciplinary problems requiring special attention without any long term benefit from it

Although in the cross sectional sense there is no one clinical or psychologic examination which can accurately determine what in essence must be determined that is, the adaptability of the personality a longitudinal history which considers (1) previous psychologic and social adjustment and related factors such as stability of individual members of the family and of the family group itself (2) childhood social environment (3) adjustment to military service (4) adjustment in the brig and (5) clinical evaluation of the personality as it appears in the present based on interviews calculated to assess a man s strengths as well as his weaknesses can be a fairly reliable diagnostic test This can be as accurate as many of the criteria used to disqualify a man for physical unfitness

This does not mean to imply that judicious disciplinary action is not necessary or not useful in a military environment to help maintain high standards of conduct but some types of personality maladjustments which are manifested as disorders of behavior are not remediable in either a disciplinary rehabilatative way or by psychiatric treatment in a military setting It would be well to recognize that this is so and to avoid repetitious disciplinary action against those unfit for duty

The brig psychiatrist can be helpful by advising not only as to the mental competency of the offender but also as to his ability to benefit from disciplinary and rehabilitative action When justified the offender s psychologic problems should be considered not only when deciding disposition before sentence (as in case of the psychotic) but also when imposing sentence (should psychologic problems be relevant), and when conferring on completion of sentence

With this in mind the function of the brig and of brig time can be compared to the recruit training period when many factors of the erstwhile civilian's personality are observed, among which is his ability to adjust to military life In this case, however, the men involved have presented as a symptom of their possible unfitness a violation of military law and have been discovered as possibly unsuitable for service sometime after the grace period of recruit training

SUMMARY

The brig psychiatrist can help maintain good standards of performance of military personnel and aid in reducing the brig census The offense of unauthorized absence which accounts for most confinements to the brig may be a symptom of severe psychopathology Because of their pre-existing personality defects, certain nonpsychotic persons who are generally classified as having character and behavior disorders may be incapable of adjusting to military life and incapable of sustained, productive work Often such persons are chronic problems for both the medical department personnel and those concerned with maintaining discipline The brig psychiatrist can contribute helpful information concerning not only the mental competency of prisoners but also relevant and important psychologic factors contributing to the offense and most important, the fitness of a man for return to duty on completion of his sentence

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BOOK REVIEWS

Gastric Cancer by *Alfred Hanson* M D Attending Surgeon Adelphi Hospital Director of Surgery Brooklyn Hospital for the Aged Surgeon Manhattan General Hospital Instructor in Anatomy New York Medical College and Flower Hospital Illustrations by *Alfred Feinberg* Instructor of Medical Illustration Department of Pathology College of Physicians and Surgeons Columbia University New York N Y 316 pages illustrated Grune & Stratton Inc New York N Y publishers 1953 Price $7 50

This comprehensive monograph is in reality a cumulative review of the extensive literature on gastric neoplasm written chiefly for the general surgeon and practicing physician The first 43 pages are devoted to a consideration of the anatomy and histology of the esophagus stomach, duodenum, and jejunum Then follow chapters on incidence, cause, pathology, symptomatology, diagnosis, and differential diagnosis The second half of the book is devoted to surgical considerations, including chapters on pre

surgical preparation with emphasis on nutritional electrolytic, and blood volume determinations in the preliminary evaluation of the patient A chapter is devoted to the various methods of anesthesia anesthetic agents and an evaluation of the advantages and disadvantages of each The meat of the book is in chapter 10, which reviews the surgical treatment of gastric carcinoma This covers the chronologic and historical progress from 1810 to 1947 and describes in detail the various modern methods of gastrectomy The various technics and methods of performing gastrostomy are also given

There are sections on postoperative treatment complications and prognosis A complete list of the most important references is given The book is well illustrated and adequately indexed This excellent review makes it clear that the results of modern efforts to discover carcinoma of the stomach at an early stage and to treat it adequately, still leave room for improvement. This book should be well received by the general surgeon and the general practitioner, as well as those interested primarily in the problem of gastric neoplasia

—Comdr G E Cummings MC USN

Modern Therapeutics for General Practice by 53 authorities Edited by *Austin Smith* M D Editor of the Journal of the American Medical Association and *P L Werrin* M D Secretary Committee on Research American Medical Association 1146 pages illustrated P B Hoeber Inc New York N Y published 1953 Price $20

This book is a compendium of therapy for general practice in the broad sense of the word Fifty three authors have contributed sections which vary from a general one on the patient physician relationship which discusses medicine and the law professional records et cetera to sections encompassing such highly specialized topics as toxicology and poisoning by the newer *types of pesticides Such a diversity of subjects has not been* at the expense of adequate coverage for treatment of more commonly encountered diseases The treatment of disease cannot be mechanical and it involves more than the prescription of recommended medicaments It is not suggested that this or any other publication should serve as a substitute for individual judgment and appraisal but that its principal value lies in making it possible for the average physician to have the advantage of the studied opinion of various experts on forms of therapy in their *own special fields*

The editors correctly assume that because the modern practitioner is confronted with more treatments than he can personally assess this book will be of value to him

—Lt Col F L Bauer MC USA

ELECTROCARDIOGRAPHY AND THE GENERAL PRACTITIONER

JAMES E GOODMAN *Lieutenant MC USNR (1)*

BECAUSE of the increasing correlation between ECG's and the clinical and pathologic findings of cardiac disease in the past 20 years it is necessary for the general practitioner to have a basic understanding of electrocardiography Its values and limitations as a diagnostic aid, therapeutic guide, and basis for prognosis will be discussed

As a diagnostic aid, the ECG is frequently disappointing, usually because of ignorance of its limitations Conversely, it is often neglected when it might be of corroboratory value Some of the conditions in which an ECG may be of value are (1) coronary insufficiency (2) myocarditis such as that associated with acute rheumatic fever, pneumonia, et cetera, (3) any disturbance in cardiac rhythm, (4) congestive heart failure, and (5) certain specific states of altered physiology which may be due to endocrine imbalance, vitamin deficiencies, disturbance of electrolytes in the blood, or specific organ dysfunction such as renal failure

CORONARY INSUFFICIENCY

In the *diagnosis* of coronary insufficiency, the ECG is frequently neglected because we fail to recall that a patient with symptoms of an intestinal obstruction may well have a posterior wall infarction, or that coronary insufficiency occurs in the young men of military age, but the most serious mistake of all is that of diagnosing coronary artery disease on the basis of an ECG which shows changes indicative of coronary insufficiency Coronary insufficiency is a dynamic rather than a pathologic concept and hence expresses the changes incidental to the diminished oxygen supply, relative or absolute, which is available to the myocardium at the time the ECG was made The primary causes which bring about the clinical findings and electrocardiographic changes found in coronary insufficiency are (1) decrease in the coronary flow, (2) defects in the quality of the blood flowing through the coronary vessels, especially with regard to oxygen content, (3) increase in the work of the heart without equivalent increase in the coronary flow, and (4)

(1) U S N l Sch ol of A iat on Med cine U S Na l Air Statio P nsacol Fl

hypertrophy of the myocardium, because this leads to stretching of the coronary arteries with consequent narrowing (hence relative insufficiency of coronary blood flow), and because it is not accompanied by any increase in the number of capillaries (2)

With the above points in mind it becomes apparent that an ECG may exhibit changes which the interpreter rightly calls coronary insufficiency although the coronary arteries may be normal Such a situation (1) might be due to a feeling of apprehension at the time the tracings were being made resulting in increased cardiac output with associated hypertonicity of the coronary artery musculature (2) might be present if the subject were anoxic for any reason (3) might result from extreme exertion (4) might develop from the diminished oxygen availability associated with marked anemia or carbon monoxide poisoning (5) might result from the increased workload of the heart in hyperthyroidism (6) might accompany the diminished coronary flow resulting from the diminished time of diastole (the time when the coronary arteries have their greatest component of filling) associated with an extremely fast heart rate such as occurs in shock and (7) might be due to other less common conditions which are not associated with coronary artery disease

Thus it is evident that an electrocardiographic report stating *that there is evidence of coronary insufficiency, does not define* the cause This the examiner should search for A roentgenogram of the chest and blood pressure readings will give some measure of left ventricular hypertrophy The presence or absence of cyanosis red blood cell counts, and hemoglobin determinations will aid in evaluating the oxygen-carrying power of the blood Murmurs if present, should be studied for their role in increasing the workload of the heart Emphysema and other chronic pulmonary disease should be considered because of the part they play in deficient oxygenation To this end a vital capacity determination may yield useful information Neurogenic factors because of their ability to diminish coronary flow should be evaluated by measuring blood pressures and pulse rates before *during and after the completion of the ECG The age of the* patient, palpation of radial arteries direct visualization retinal arteries and ability of the kidneys to concentrate urine are useful aids in determining progression of arterial and arteriolar sclerotic changes

The physician therefore, must realize that the ECG has marked limitations in the study of coronary insufficiency, the final diagnosis must rest on the results of careful consideration of the many factors which may cause electrocardi

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(2) Katz L N Electrocardiography Lea & Febiger Philadelphia Pa 1946. P 244-245

graphic changes A state of coronary insufficiency may exist in times of stress, and yet not be suspected from the ECG Coronary artery spasm may produce pain due to ischemia of the myocardium, and an ECG taken as soon as the pain is reported may demonstrate no abnormality, for if the ischemia is not prolonged, recovery may already have occurred Thus we see that a normal ECG does not necessarily rule out coronary insufficiency as a cause of thoracic pain A patient with angina pectoris who has a normal ECG should be given the Master's 2 step and anoxia tests

To correlate the positive value with the limitations of electrocardiography, it should be recognized that the symptoms of myocardial ischemia may vary widely from the classical findings of angina pectoris Minimal chest pain with leukocytosis, an elevated sedimentation rate, and a low grade fever may be caused by atypical pneumonia or by an unsuspected myocardial infarction An ileus of the small bowel may be unexplainable on a basis of abdominal disease, and the patient may have an infarction of the posterior myocardial wall An ECG is of value in many instances in which there are none of the classical symptoms of coronary insufficiency

In *differential diagnosis,* the ECG may or may not be of value The occasional discovery of an unsuspected infarction more than compensates for the tracings which point to an erroneous diagnosis Acute cholecystitis may aggravate a tendency toward coronary insufficiency and it is, therefore, possible to demonstrate electrocardiographic changes due to coronary insufficiency during an attack of acute cholecystitis Such a situation may conceivably lead to bad management of the patient, but fortunately the symptom complex of acute cholecystitis is such that other clinical findings may point toward the diagnosis

As a *therapeutic guide* in coronary insufficiency, the ECG is of limited value Following a myocardial infarction successive tracings show an evolutionary pattern which stabilizes after a few weeks The varying degrees by which this stabilized tracing approaches normal is a notoriously poor guide to good management

In the *prognosis* of coronary insufficiency, the ECG has definite limitations A patient who develops angina pectoris with less and less exertion, may have an ECG which shows little or no variation from month to month Occasionally a patient who has had an infarction and an extremely abnormal ECG, may recuperate better than one who has very little evidence of infarction on his tracings

ACUTE MYOCARDITIS

In considering the value of the ECG in the diagnosis, therapy, and prognosis of acute myocarditis one must correlate carefully the bulk of associated clinical and laboratory data One of the electrocardiographic measurements frequently considered to be of value in following the course of an acute myocarditis is the P R interval In rheumatic fever this may be one of the first evidences of myocardial involvement and its return to a stable form may be slow Because this stabilization frequently occurs at a reading greater than the upper limit of normal, the actual measurement is not always of positive value Nonstable P R intervals which are progressive i e , the interval is becoming longer and longer must be considered evidence of progressive myocardial involvement Therapy, therefore, may be influenced greatly or very slightly by the electrocardiographic changes

In the prognosis of patients with acute myocarditis the ECG is of value in so far as the progressive abnormalities are correlated with an extension of pathologic changes, but the isolated ECG gives little information on which one might safely make a long range forecast There are clinical signs and other laboratory tests which will usually prove to be of greater value than the ECG in the prognosis of acute myocarditis

CARDIAC ARRHYTHMIA

Of all the diagnostic tests in the physician s armamentarium none is so gratifyingly unequivocal as the ECG in patients with cardiac arrhythmia The ECG graphically illustrates the electrical actions of the auricular and ventricular contractions and demonstrates the relationship between the two activities The differentiation of paroxysmal auricular tachycardia from paroxysmal ventricular tachycardia or paroxysmal auricular fibrillation on clinical evidence only is difficult The differential diagnosis of sinus bradycardia from heart block is also difficult without an ECG It is admitted however, that there are only a few arrhythmias the cause of which can be determined by electrocardiography Heart block due to digitalis effects gives an ECG suggestive of a causal relationship but such a deduction is not without possible error A definite diagnosis of arrhythmia is of value in therapy and prognosis only to the extent that the clinician is able to evaluate the electrocardiographic findings The prognosis and therapy of a patient with frequent premature ventricular contractions who is receiving digitalis will be different than for such a patient who is not receiving digitalis Prognosis and therapy therefore, will best be accomplished not by considering the arrhythmia alone but through the correlation of the arrhythmia with the clinical findings

CONGESTIVE HEART FAILURE

In congestive heart failure, the cause of the failure may be indicated by the ECG In acute congestive failure, the following causative factors can usually be differentiated by means of an ECG taken soon after the onset of symptoms: (1) myocardial infarction, (2) pulmonary infarction, (3) pericarditis with sufficient fluid to cause tamponades, and (4) gross irregularities of rhythm Admittedly, there are many features about the clinical findings which may be more satisfactory in making a diagnosis Even so, the ECG is helpful In treating congestive failure, the ECG is of value, particularly if an arrhythmia is present or develops, but beyond that it seldom is of much benefit except that its use as a diagnostic agent will occasionally indicate the initial therapy This particularly applies to those patients in whom the ECG has focused attention on the likelihood of pericardial effusion and for whom the usual therapeutic agents for congestive failure may be of little or no value

In chronic congestive failure, the ECG may indicate the presence or absence of such etiologic factors as coronary insufficiency, myocardial degenerative changes sometimes referred to as chronic myocarditis ventricular strain due to valvular disease, hypertension, pulmonary fibrosis, et cetera, irregularities of rhythm, and certain metabolic or deficiency diseases such as beriberi and hypo- or hyper thyroidism Even in recent textbooks by our most astute clinicians we find discussions on the use of digitalis and diuretics and very little emphasis on the need for directing treatment toward the cause of the failure such as giving desiccated thyroid to a patient with subclinical myxedema and symptoms of early congestive failure Thus by aiding in more accurate diagnosis, the ECG may have definite value in the therapy of chronic congestive failure

MISCELLANEOUS CONDITIONS

For a physician in civilian or military practice who treats patients with altered cardiac physiology but does not make a special study of cardiology, the knowledge that cardiac dysfunction may occur as part of a general metabolic change is usually sufficient for that physician to achieve proper diagnosis and therapy The association of cardiac dysfunction with hypo- and hyper thyroidism and with beriberi is well known More recently the effects of a very high or very low potassium ion concentration in the blood has assumed new prominence (because of potassium administration along with cortisone in many instances) Probably less well known is the fact that the calcium ion concentration has a definite effect on cardiac function Suffice it to say that the ECG will usually demonstrate changes

that vary from nonspecific to nearly pathognomic in certain patients with altered metabolism and, therefore, should be used as one of the laboratory procedures which may aid in diagnosis and treatment

In evaluating patients with a heart murmur the value of the ECG is rightfully subordinated to that of a thorough history and physical examination Because the ECG may demonstrate strain patterns even before a roentgenogram of the chest or the symptoms hint at impending failure its use should not be neglected even in those patients in whom the rest of the clinical and laboratory work up is within normal limits

CONCLUSIONS

The ECG has been neglected by many clinicians because they failed to appreciate its potential value It has been abused by others who have failed to place it in its proper designation of a laboratory test with definite limitations

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BOOK REVIEW

Pr ct l Blood G p g Method A Ma ual f Imm ohemat l gy by *R be t L W ll* M D Depa m t of R ea h Med Oh St t U t ty Hosp t l C l mb Oh o Forme ly Blood R h Secti n Depart me t f B l g Product Army M d I Depa tme t R ea h nd Gradua S hool W h gt D C Ameri Le tur S P blic t on N 122 A M g ph Th Ba ton D t f Ame L ur H m t l gy Ed d by *Rus ll L. H d n,* M D Formerly Ch f f th M d l D on Cl el nd Cl Cl l nd Oh 175 page Ch l C Th ma P bl h Spr gf ld Ill 1952

A book that in a simple straight forward manner presents the fundamentals of a subject is always an aid to those with an interest in that subject This is such a book It covers the subject of basic immunohematologic principles and technics including the ABO Rh and the other blood groups The text is generally clear and concise The format is good as a basic text but is not readily adaptable for use as a laboratory manual No modus operandi for medical laboratories is outlined The section on the crossmatching tests is unduly brief in view of the importance of this subject to all clinical laboratory personnel Likewise the chapters on autoagglutinins and antibodies associated with hemolytic anemias are not as complete as would be desirable —*Capt E E Pontius MC USA*

RAPID ANTERIOR ROOT CANAL THERAPY

LOUIS L LEFF *Captain, DC USAR (1)*

THE history of apicoectomies or root amputations is well known What is important is the fact that a quick, safe procedure can be performed in the office of the general practitioner whereby most infected anterior teeth can be treated so that they will continue to function for an indefinite period The procedure here presented is applicable for all apicoectomies regardless of whether (1) the tooth be vital or nonvital, (2) a periapical radiolucent area is present, or (3) the apex be fractured, curved, or otherwise abnormal The age and general health of the patient and the condition of the mouth, teeth, and periodontium must, however, be considered

In acute cases, immediate drainage is important The pulp chamber is opened with a bur A barbed broach is passed through the canal and the pulp is extirpated, following which the patient is given 300,000 units of procaine penicillin intramuscularly and advised to use hot irrigations of saline solution at home or in his barracks *The apicoectomy is performed when the pericementitis* and the acute stage have completely subsided

TECHNIC

Sufficient local anesthesia is given so that supplemental anesthesia will not be necessary once the flap is raised In filtration or conduction anesthesia, or both, can be used Palatal anesthesia is indicated for all maxillary teeth because perforation of the lingual plate of bone is common and nerve ramifications and anastomoses exist within the palatal tissue

The canal is reamed and filed until a No 5 or 6 root-canal file passes through the apex or in the case of a curved root tip, as close to the apex as possible The filings should be relatively clean and hard

A semilunar incision is used for an apicoectomy with no radiolucent area about the apex, or with a relatively small radiolucent area which extends along the root surface for no more than one third the length of the root An oblique incision is used for those teeth in which the periapical radiolucent area

(1) Camp Gordon Ga t t me f writing ow 1737 St. Joh s Pl c Brookly 3 N Y

that vary from nonspecific to nearly pathognomic in certain patients with altered metabolism and therefore, should be used as one of the laboratory procedures which may aid in diagnosis and treatment

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CONCLUSIONS

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BOOK REVIEW

Pr ct c l Bl od Gr p g Method A Ma ual f Imm hemat l gy by *R be t L W II* M D Depa tm t f R ea h Med Oh St t U ty H p t l C lumb Oh o Forme ly Blood R ch Sect Depa t me t of B l g Product Army M d l Depa tme t R e h od Gr dua Sch l W h gt D C Ame Le tur Se P bl c t on N 122 A M g ph Th Ba ton D f Ame ic L tur H mat l gy Ed t d by *Rus II L H d n* M D Forme ly Ch f f th M d l D on Cl l d Cl Cl l nd Oh 175 pag Charle C Thoma P blish Spr gf ld Ill 1952

A book that in a simple straight forward manner presents the fundamentals of a subject is always an aid to those with an interest in that subject This is such a book It covers the subject of basic immunohematologic principles and technics including the ABO Rh and the other blood groups The text is generally clear and concise The format is good as a basic text but is not readily adaptable for use as a laboratory manual No modus operandi for medical laboratories is outlined The section on the crossmatching tests is unduly brief in view of the importance of this subject to all clinical laboratory personnel Likewise the chapters on autoagglutinins and antibodies associated with hemolytic anemias are not as complete as would be desirable —*Capt E E Pontius MC USA*

the aspirator tip is left over the shortened apex and cotton points are inserted into the canal to dry it A cotton point moistened with alcohol can be used in the canal and this can be followed with warm air The canal must be dry before the root canal filling is inserted While the aspirator is keeping the periapical area dry, chloropercha is pumped into and through the canal by means of a gutta percha point The chloropercha is used to seal the tubules and lubricate the canal walls A

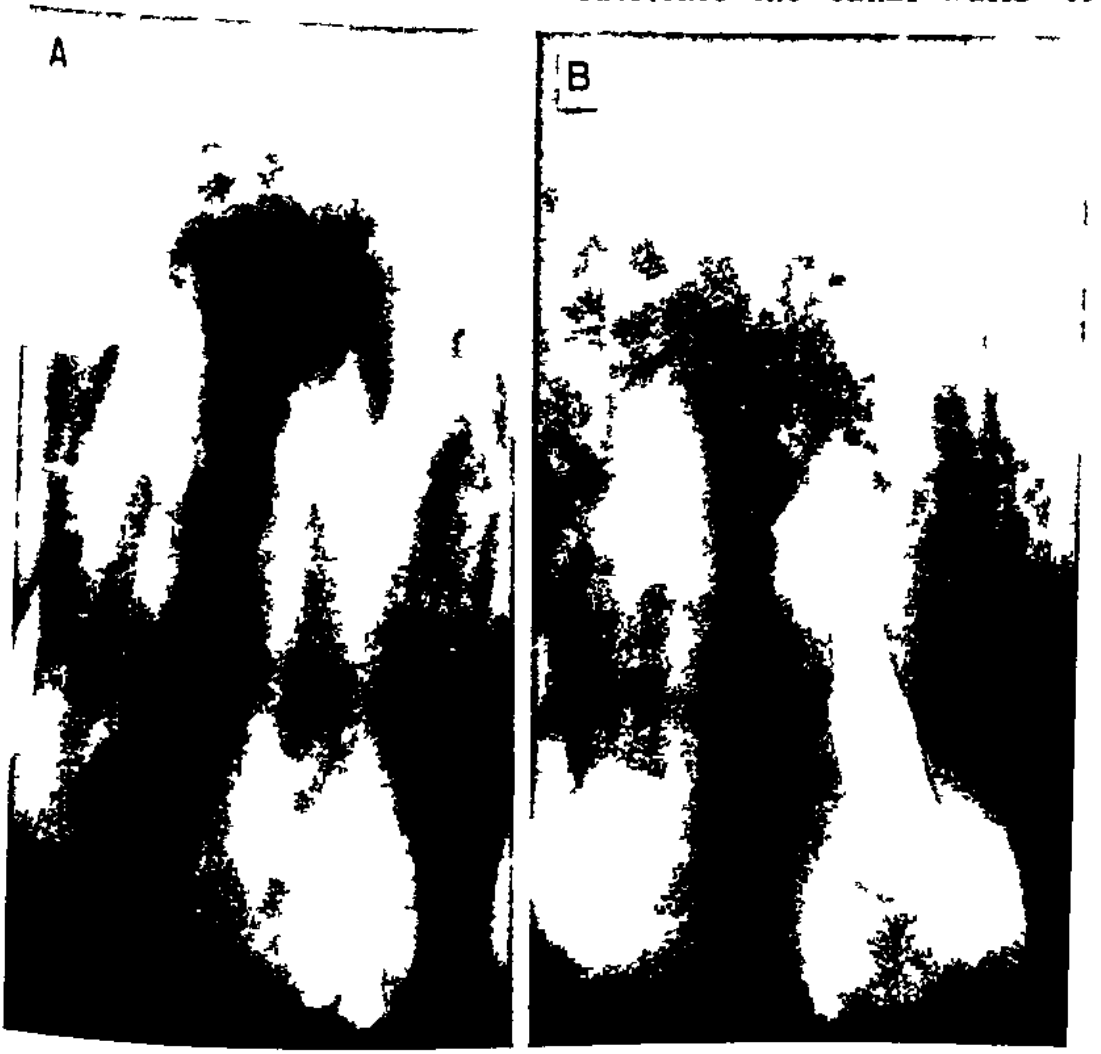


Figure 2 (A) *Preoperative roentgenogram taken on 22 May 1952 the day of operation.* (B) *Postoperative roentgenogram, taken on 8 September 1952 showing regeneration of bone.*

gutta percha point is placed in the canal so as to extend through the shortened apex into the periapical area The canal is packed with gutta percha points which are then condensed The excess gutta percha points are removed from the apex by the use of a warm plastic instrument and then followed with a pledget of cotton moistened with chloroform to seal and smooth the gutta percha The opened cavity is again flushed with benzalkonium chloride to remove the loose debris If the cavity is larger than

1 cm by 1 cm a piece of gelfoam about half the size of the cavity is placed in it

A roentgenogram should be taken before the flap is sutured in order to be certain that the entire apex has been removed and that large pieces of gutta percha have not been left in or about the periapical region Patients in whom the apex of the tooth was sectioned and left in place unintentionally have been seen The flap is replaced and closed with silk sutures The lingual surface of the tooth is closed with temporary stopping or cement and if the tooth has not been ground out of occlusion this is accomplished

Postoperative instructions are important Cold compresses should be placed over the operative site for the first 24 hours and occasionally for 48 hours Warm saline mouthwashes should be used frequently for the first week Codeine and aspirin may be prescribed although in most cases empirin compound will suffice Sutures are usually removed on the fourth postoperative day Occasionally a hematoma is formed and in that case external heat is used after the first 48 hours of cold applications Regeneration of bone in most patients can be seen roentgenographically within 3 or 4 months after operation (fig 2)

CONCLUSIONS

Most infected anterior teeth can be treated and retained by means of apicoectomies in the average healthy patient The operative procedures involved are relatively simple and require only about 30 minutes Complications are infrequent

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BOOK REVIEW

Mid-Ce tury P ychiatry A O rv w d t d by R y R Gri k M D D tor of In t t t for P y hosom t d P ych tric Re e rch and T g M cha l R H p tal Ch go Ill 183 pag Cha l C Thom P bl he Spr gf ld Ill 1953 Pr ce $5 50

This book surveys the status of psychiatry today It is composed of 12 chapters each by a distinguished contributor to the field of psychiatry neurology psychoanalysis or sociology The basic goal of the book is to point out the need for a methodologic solution to the problems of the integration of the disciplines contributory to the science of human behavior It is recommended with enthusiasm —*Comdr L S Maalem Jr MC USN*

TECHNIC FOR ROOT CANAL THERAPY

ROBERT E PERKINS *Captain USAF (DC)* (1)

THIS article presents a technic for root canal therapy that has given good results in the treatment of 300 patients All were members of the Armed Forces, from 18 to 35 years of age, and 195 of them have been under observation for from 1 to 3 years after operation Root canal therapy, or endodontia, is a branch of dentistry which is concerned with the dental pulp This treatment is indicated for a diseased tooth when its supporting structures are normal, and when periapical or periodontal infections have not destroyed more than one third of the supporting structures of its root Patients for root canal therapy should be selected because the tooth is of value either for natural function or as an abutment for a prosthetic restoration

Many technics for root canal therapy have appeared in the literature Grossman (2), Schwartz (3), Ostrander et al (4), and Lucas (5) have reported various technics Regardless of the technic used, the following must be accomplished (1) removal of all pulp from the root canal and the pulp chamber, (2) adequate mechanical preparation of the root canal and the pulp chamber, (3) sterilization of the pulp chamber and the root canal, (4) sufficient filling and hermetic sealing of the canal, and (5) surgical removal of all necrotic and diseased tissues including the involved portion of the root in patients in whom periapical infection is present

The 9 steps in the technic for root canal therapy are

1 *Anesthetization of the infected tooth*

2 *Application of the rubber dam* The tooth and the 2 teeth adjacent to it are isolated by a rubber dam to prevent the seepage of saliva or blood from contaminating the area and the root canal After the dam has been applied, tincture of merthiolate is applied to the area If structural conditions preclude the use of a rubber

(1) U S Air Force Hospital Scott Air Force Base Ill
(2) Grossman L I Root Canal Therapy 3d edition Lea & Febiger Philadelphia Pa 1950 pp 183 224
(3) Schwartz J B Periapical infection of dental root canal therapy Dental Items Interest 71 1117-1128 No 1949
(4) Ostrander F D Crowley M C and Dow J Clinical study of treatment of root canal and periapical infections with penicillin J Dent Research 26 403 407 Dec 1947
(5) Lucas L A Endodontia Dent Surv 25 1007-1010 July 1949

dam the tooth may be isolated with inlay wax gauze or cotton rolls

3 *Gaining access to the canal* Entrance to the canal of anterior teeth is made slightly above the cingulum The position of the pulp chamber serves as a guide in premolars and molars The contra angle handpiece with a No 4 round bur or No 35 inverted bur is held at a 75 angle the enamel is penetrated and the dentine entered to a depth of about 1 mm A No 6 round bur is used to complete the entrance A smaller bur may break when the canal is entered The opening to the canal may be enlarged with a No 8 round bur if desired The straight handpiece may be used to widen the opening which must be ample to provide access for pulp extirpation and preparation of the root canals

4 *Pulp extirpation* If the pulp is not necrotic, it may often be entirely removed in one operation This is accomplished by using a barbed broach No 1 file or reamer which is inserted along the side of the canal turned 180 and withdrawn Decomposed pulps are removed in a similar manner The pulp in the chamber is removed with a No 4 or 6 round bur and a No 23 explorer Care should be exercised to remove all the pulp to prevent infection and discoloration of the tooth After the pulp has been extirpated, the canal is irrigated with a 3 percent solution of hydrogen peroxide followed by chlorinated soda solution This removes blood and remnants of pulp and minimizes the possibility of later forcing these particles through the apical foramen A roentgenogram is taken with a reamer in the canal to determine whether the apex has been reached

5 *Preparation of the canal* The canal is prepared sufficiently to receive a filling material Canals in lateral teeth are enlarged to the size of a No 3 file and those in central incisors and cuspids to the size of a No 4 file This is done by inserting a No 1 reamer making a 180 turn and withdrawing it If no resistance is encountered a complete turn can be made This action should be continued until the instrument has reached the apex This is repeated with a No 1 file alternated with the reamer until the canal is the size of a No 4 reamer Vertical as well as rotary motion of the instrument may be exerted Care must be taken to avoid forcing debris into the periapical tissue

6 *Irrigation of the canal* The pulp chamber and the root canal are irrigated with a chlorinated soda solution and hydrogen peroxide both U S P The patient s head should be tilted forward to reach the upper teeth and backward for the lower teeth This position will prevent the solution and debris from escaping into the periapical tissues The irrigating needle should not be inserted more than one half the length of the canal The solution is injected from the syringe with light pressure on the plunger

After the canal has been irrigated with hydrogen peroxide, chlorinated soda solution is used The canal is irrigated for a third time with distilled water or normal saline solution to wash out the hydrogen peroxide Next, the canal is aspirated with a syringe and needle and thoroughly dried with sterile absorbent points

7 *Medication* Crystalline procaine penicillin G in oil with aluminum monostearate, 300 000 units per cc , has been used to treat most cases Grossman *(6)* reported good results from the use of a streptomycin penicillin suspension for the treatment of pulpless teeth A sterile syringe with a needle somewhat smaller than the canal is used to inject 0 5 cc of the penicillin into the canal When injecting the canal of upper teeth, the patient's head should be tilted back as far as possible to enhance the flow of the drug into the canal and into the periapical tissues After the canal is filled with penicillin, a sterile, clipped absorbent point is inserted into it The paper point, blunted to avoid irritating the periapical tissues, may be dampened with beach wood creosote and sealed in the canal with cement to remove any putrescent odor The patient is advised to return in 24 hours

8 *Bacteriologic study* The success of root canal therapy depends in great part on the sterility of the canal, and this is confirmed by a negative bacterial culture Failure to adhere strictly to the principles of asepsis may cause the bacterial report to be erroneous When the patient returns, the canal is opened, the dressing is discarded, and the penicillin is washed out with warm, sterile, distilled water All traces of the water and medicaments are then removed from the canal with absorbent points and, after the canal has been thoroughly dried, a fresh absorbent point is moistened with a drop of sterile distilled water and inserted into it for 3 minutes The point is carefully removed from the canal and transferred to a container of trypticase dextrose broth and incubated for from 24 to 48 hours Grossman *(7)* considered brain heart infusion broth, Roseman s glucose brain broth, and glucose ascite broth a satisfactory media for culturing root canal material

If a negative culture is obtained after incubating for 48 hours, the canal can be filled safely If the culture is positive, the study should be repeated until a negative one is obtained Bender and Seltzer *(8)* recommended the use of a combination of penicillin, streptomycin, chloramphenicol, and sodium caprylate for patients whose culture is repeatedly positive This combination of antibiotics and a fungicide yielded a negative culture in 97 percent of their patients after an average of 1 1 treatments

(6) See p 2 1 of footnote reference (2)
(7) See p 275 of footnote reference (2)
(8) Bender I. B. and Seltzer S. Combination of antibiotic and fungicidal ingredients in treatment of infected pulpless tooth J Am Dent A 45 293 300, Sept 1952

9 *Filling the canal* The canal may be filled when 2 negative cultures are obtained and the tooth is free of tenderness Gutta percha points and root canal sealer are used to fill the canal The diameter of the point used should approximate that of the canal and after it has been prepared it is kept in the sterilizing tray The gutta percha point cannot be properly prepared without the aid of roentgenograms The root canal sealer should be mixed at this time Using a pumping and rotary motion it is carried into the canal with No 3 root canal pluggers The No 9 or 11 plugger is used with a similar motion The prepared gutta percha point is saturated with the sealer and inserted into the canal The gingival third of the canal may require extra gutta percha points to completely fill it but if the apical third of the canal is well sealed it is not necessary to pack the canal Roentgenograms are taken to determine whether the canal is sealed excess gutta percha protruding from the canal is removed with a warm round burnisher and the chamber is filled with oxyphosphate cement The patient is advised to return 2 months later for a roentgenogram

Root amputation is indicated in most patients with periapical infection If the peridental membrane shows only a slight thickening it is preferable to keep the patient under observation for several months rather than do an apicoectomy

DISCUSSION

The technic presented in this article may be used to treat any root canal but all cannot be approached in the same manner In patients with pathologic or mechanical exposures of the pulp nonsuppurative pulpitis, or with degenerative and chronic hypoplastic pulpitis it can be extirpated the canal partially red irrigated medicated and a dressing inserted during irst visit In acute suppurative pulpitis chronic ulcerative pitis gangrene of the pulp or any condition with pus format drainage should be established and continued until the evid of pus has completely disappeared and the tooth is not sens to percussion \mple drainage cannot be obtained throu canal in many patients unless a periapical incision is When there is no evidence of pus the canal may be tre the technic that has been described

ESSENTIAL HYPERTENSION

Treatment With Hexamethonium and Apresoline

RICHARD P SHAPERA *Lieutenant junior grade MC USNR (1)*

FREDERICK R LANG *Captain MC USN (1)*

ESSENTIAL hypertension is a common, often progressive and fatal disease, for which a variety of medical, surgical, and psychiatric procedures have been used The results of these have been inconstant, temporary, palliative, or unsuccess ful Recently 2 new drugs have been added to our therapeutic armamentarium, namely hexamethionium and 1 hydrazinophthala zine hydrochloride (apresoline) which may be given singly or together

Apresoline produces moderate reduction of blood pressure in hypertensive patients *(2)* The results are most marked in those with malignant hypertension and those who have had unsuccessful sympathectomies In addition to lowering the blood pressure, this drug increases the renal blood flow It antagonizes circulating humoral pressor substances The most serious side effects are headache, nausea and vomiting *(3 4)* Tolerance developed in most patients in whom this drug was used alone *(4)*

Hexamethonium attacks adrenergic and cholinergic nerve impulses at the autonomic ganglia It is the more potent of the 2 drugs and when used alone it often results in wide fluctuations of the blood pressure *(5)* Because serious hypotensive episodes, and even death, have resulted from the use of this drug, great caution must be exercised in the selection and control of patients *(3 6)* The serious side effects that have been noted were secondary to depression of the autonomic ganglia These include severe hypotension (especially postural) and gastrointestinal dysfunction

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(1) U S Naval H p tal A napolis Md

(2) Schroeder H A Eff t of 1 hyd zi phthalazine i hypertens n Circulati 5 28-37 Ja 1952

(3) Gr nsoo K S Orga E S Rowe C R Jr nd S ber H. A Caut on w th r gard to us of be ameth ni m and pr s line J A M A 149 215-220, May 17 1952

(4) J h so R L. Freis E D nd Schnaper H W Cl n cal evalmat n of 1 hydra nophthalazine (C 5968) hypertens on w th pe ial r fer nc t It rmating treat ment w th h meth i m Circulat n 5 833-841 Jun 1952

(5) Schroed r H A Control of hypert nsi by be methon m and 1 hyd azi phthala zine prelim nary obs rvat Arch I t Med 89 523 540, Apr 1952

(6) Goldst ne B De th ociated w th meth iam tr trent South Africa M. J 26 552 554 July 5 195

ranging from diarrhea to obstipation and ileus Less serious and usually transient side effects include blurring of vision in hyperopic persons dryness of the mouth diminished sweating and disturbances of body temperature regulation especially of the extremities (4). Bethanechol chloride and laxatives may be used to combat serious constipation which some believe, may lead to accumulation and retention of the drug in the intestine and dangerous swings in its absorption rate Close attention must therefore be paid to bowel function when hexamethonium salts are administered orally Some authors prefer subcutaneous administration because of greater reliability of therapeutic effect (7).

Because of the more favorable results with the use of apresoline in patients who have had unsuccessful sympathectomies and because it appeared rational to treat essential hypertension by attacking concurrently both humoral and neurogenic etiologic factors, hexamethonium salts and apresoline have been used in combination (4 7) Schroeder (5) reported experience with 60 patients taking these drugs for from 10 to 28 weeks No tolerance developed in these patients In fact most of those who were able to return home and to work while taking these drugs found that they required smaller doses than were established at the hospital Headaches often a serious side effect when apresoline is used alone thought to be due to the antihistaminase action of the drug were not a problem when hexamethonium was administered prior to the apresoline With continuous administration the blood pressure was held at or near normotensive levels in all the patients with benign hypertension and in 20 of 22 patients in the malignant stage There were 3 deaths 2 due to pneumonia and 1 as a result of renal insufficiency Six patients in malignant stages discontinued medication and all of these died There were transient but no permanent manifestations of cerebral ischemia and cardiac failure

McQueen (8) studied renal function in 8 hypertensive women and found following administration of hexamethonium that there was an initial reduction of the glomerular filtration rate and the renal plasma flow The plasma flow returned to normal quickly, however especially in those with little renal impairment The glomerular filtration rate returned to normal but more slowly than the renal plasma flow Hexamethonium is entirely excreted in the urine and therefore with reduced filtration rates there is retention of the drug in the body The most likely mechanism for the compensatory renal hemodynamic readjustment is abolition of tone in the glomerular arterioles by hexamethonium

(7) Kvale W F Hexamethonium and procaine Proc Staff Meet Mayo Clin 27 489-494 Nov 19 1952

(8) McQueen E G Hexamethonium bromide and kidney function M J Australia 1 769-771 June 7 1952

CASE REPORT

A 47 year old man whose essential hypertension had become progressively worse in the 7 years preceding admission entered this hospital Five years before the present admission and after extensive study to rule out other conditions, a bilateral, subtotal sympathectomy was performed with improvement which lasted for only 3 months Bed rest, weight reduction, low salt and rice diets, sedation, and veratrum viride were of no avail Six months before admission the hypertension was considered to have entered the malignant stage At the time of this admission the patient complained of frequent, severe headaches, marked decrease in visual acuity, ankle edema, dypsnea on exertion, dizziness, and nocturnal cramps in the legs

Physical examination revealed a 4-plus hypertensive retinopathy, a slightly enlarged heart with a greatly accentuated aortic second sound, a palpable liver, and ankle edema Blood pressures prior to therapy ranged between 210 and 270 (systolic) and 150 and 180 (diastolic) There was a persistent albuminuria (3 or 4-plus) and the highest urine concentration was 1 014 Casts were noted on one occasion The highest nonprotein nitrogen level recorded was 49 mg per 100 cc

Hexamethonium chloride was first given in doses of 125 mg orally every 8 hours and increased until a dose of 500 mg every 4 hours was reached Apresoline was then added, starting with doses of 50 mg orally every 8 hours and increasing until a dose of 100 mg every 4 hours was reached The medications, at first were given around the clock and the dose governed by a blood pressure check prior to administration The blood pressure slowly declined until after 2 weeks of this regimen a pressure of 130/90 was reached Systolic pressures below 125 were not well tolerated and therefore the therapeutic goal was established between 140 and 160 (systolic) and 90 and 110 (diastolic) During therapy the albumin in the urine diminished to negative or a trace, the papilledema and retinal hemorrhages disappeared, the visual acuity improved greatly, the headaches, dyspnea, ankle edema, and leg cramps disappeared and the patient's sense of well being increased

The side effects encountered were lassitude, severe constipation and postural hypotension (100 systolic), all early in therapy These demanded strict confinement to bed The postural hypotension and lassitude gradually disappeared The constipation responded to laxatives and an occasional enema The 4 a m and, later the midnight doses were discontinued After a month of regulation in the hospital the patient and his family were instructed in the technic of recording blood pressure, then he was discharged to his home After 2 months he had improved suf

ficiently that his return to work was contemplated He was maintained on about 2 grams of hexamethonium and 400 mg of apresoline daily

SUMMARY AND CONCLUSIONS

Hexamethonium and apresoline are relatively recent additions to the therapeutic armamentarium for the treatment of hypertension As yet, no long term studies are available but must be awaited before any final evaluation is made In short term studies, these drugs have demonstrated their ability markedly to reduce blood pressures to normal or nearly normal levels in patients suffering with hypertension of all degrees The reductions are in general remarkably well tolerated These drugs especially hexamethonium are potent and can be very dangerous Great care must be exercised, especially in the treatment of elderly arteriosclerotic, or previously sympathectamized patients and those who have evidence of renal cardiac or cerebral damage The initial lowering of blood pressure should be gradual

Patients with mild uncomplicated hypertension should not be given these drugs, but those younger patients with severe progressive hypertension resulting in early vascular or organ damage and not responding to more conservative therapy should not be denied the possible advantage of these drugs

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BOOK REVIEW

Annual Review of Microbiology Edited by *Chas E Clift* Stanford Associate Editors *Sidney Raffel* Stanford University and *H B Baker* University of California Volume 6 492 pages Annual Reviews Stanford California publishers 1952 Price $6

This is the sixth in a series of annual symposiums on phases of microbiology Many of the sections such as the metabolism nutrition and genetics of the characterization of antibodies and the immunologic substances will appeal only to a highly group Of more general medical interest however, are tions on viruses human rickettsioses, toxoplasmosis, actions of antibiotics and chemotherapeutic agents reviews provide the reader with a remarkably wel survey of the recent literature on these subjects an extensive bibliography —*Capt W E Dye USAF (MSC)*

A MODIFIED TECHNIC FOR ANTIGEN DELIVERY

in the Cardiolipin Microflocculation Test

KENNETH F ERNST *Colonel MC USA (1)*
ROBERT R IVY *(1)*
VAUGHN YOEMANS *Master Sergeant Medical Service USA*

PUBLISHED technics for various serologic tests for syphilis, involving a mixture of antigen and inactivated serum, direct that measured amounts of antigen be placed into measured amounts of serum, and it is desirable that this ratio be maintained because significant alteration in optimal proportions may affect the accuracy of the test The VDRL test is commonly performed by accurately measuring the serum with a calibrated pipet but the antigen emulsion, being measured by delivery from a completely assembled hypodermic syringe and needle, cannot be delivered with any similar degree of precision The size of the drop of antigen emulsion is affected by the bevel and caliber of the delivery needle, by the angle at which the syringe is held, and is probably subject to a substantial mechanical error when antigen is expelled by means of the plunger in a syringe The idea of developing a procedure in which the size of the drops, and therefore the actual quantity of antigen, could be accurately duplicated, not only from test to test out from day to day, led to the evolution of the present technic

The method to be described was tried with 20 , 21 , and 22 gage hypodermic needles The 20 gage needle delivered antigen too rapidly and in drops of too great a size Either the 21 or 22 gage needle is satisfactory as both can be adjusted to deliver 60 drops of antigen emulsion per cc Although the 22 gage needle delivers antigen much more slowly it might be more desirable in inexperienced hands The 21 gage needle delivers from 60 to 75 drops per minute, depending on the angle of the apparatus, but at the same time will accurately deliver 60 drops per cc of antigen emulsion

The apparatus was tested with the needle at angles of from 20 to 90 with the horizontal Angles of 30 and less were unsatisfactory because the rate of delivery was unduly decreased and because a slight increase in the size of the drops

(1) L nerman Army H tal Sa Fra cis o Calif

was thus obtained At angles of 50 and above the delivery rate was greatly accelerated and a corresponding decrease in the size of the drops was noted At 40 however, the requirements of speed (60 drops per minute) and accuracy (60 drops per cc) were fulfilled so we have concluded that this is the most desirable angle (table 1)

TABLE 1 *The elat of rat of d l v ry and d op olum t tbe a gl of tb 21 gag e dle*

Angle (d gt s)	Rat of d livery (d p per m)	V lume per 60 drops (c)
30	35 to 40	1 2
40	60 to 75	1 0
50	70 t 80	0 9
60	80 to 90	0 8

Variation in the number of drops per minute using the same needle and the same angle for the apparatus is influenced by the quantity of antigen emulsion in the syringe faster rates of delivery being obtained when greater quantities of emulsion are in the syringe and slower rates, as the level falls A little experience with the apparatus will indicate the proper level of filling for the desired rate of delivery, but a level of from 0 75 to 1 5 cc has worked best for us The delivery may be made continuous and at the same time thorough mixing of remaining and new antigen emulsion may be attained when the syringe is refilled if the new emulsion is forcibly added to that remaining in the apparatus This is done with either a chemical pipet or a 2 cc syringe to which a 3 inch, 19 gage needle is attached

METHOD

A 5 cc syringe without the plunger fitted with a 21 gage, 1½ inch medium bevel hypodermic needle is attached to a ring stand by an adjustable clamp The bevel of the needle should face downward or parallel with the bench top To establish the proper angle for the delivery of 60 drops per cc of antigen emulsion as required in the VDRL test, the clamp is adjusted so that the point of the needle is about 4 cm and the flat, open end of the syringe about 10 cm above the table top In this position the apparatus has an angle of about 40 with the horizontal Antigen emulsion is then pipetted into the open end of the syringe the drops are counted as they fall from the point of the needle and are collected in a calibrated receptacle When 2 cc of antigen emulsion have been delivered to the calibrated receptacle, the angle of the syringe may be adjusted if nec-

essary, so that 120 drops equal 2 cc When this angle has been determined, the distance of the point of the needle from the table top is marked on a piece of cardboard and the distance of the open end of the syringe, on another (fig 1) The angle of the apparatus can then be reproduced from day to day simply

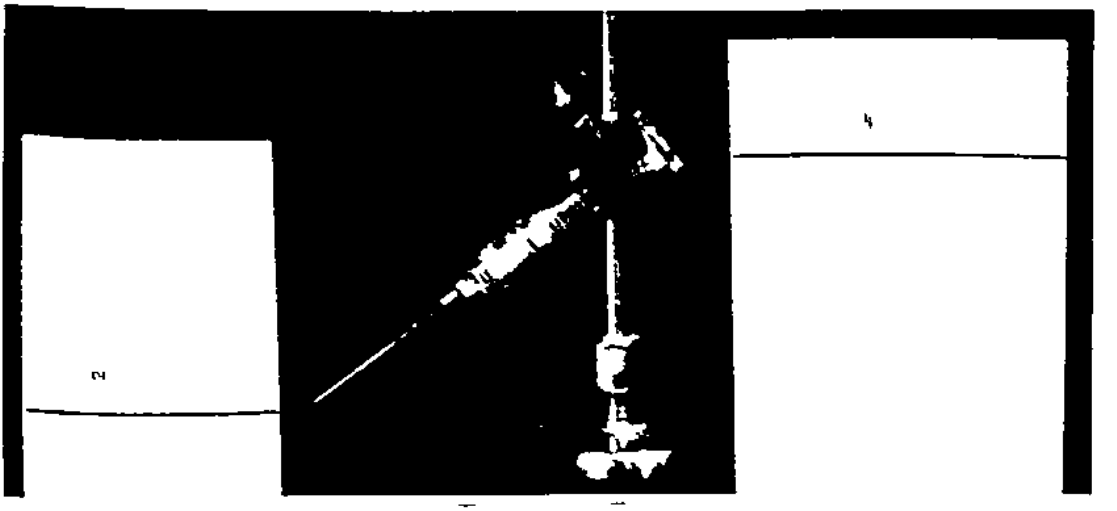


Figure 1

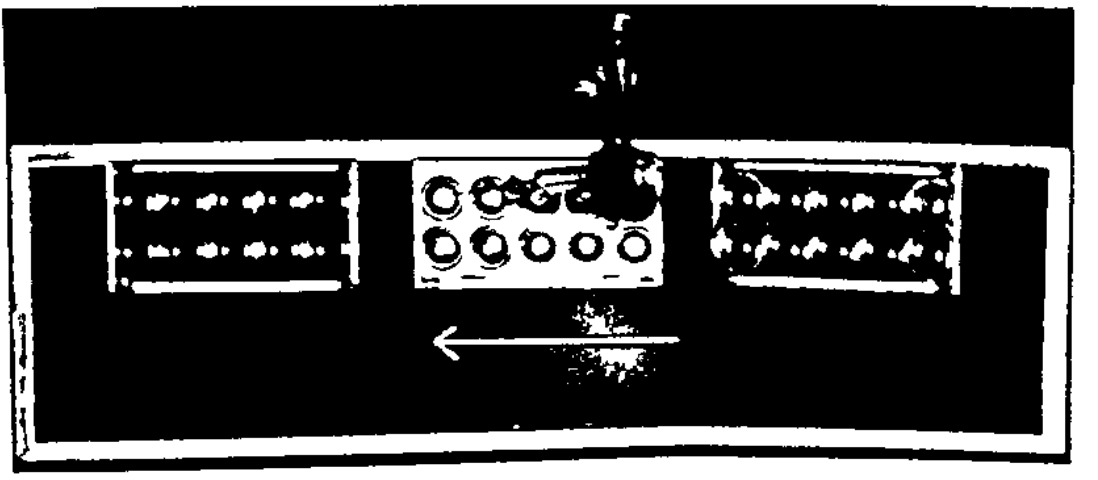


Figure 2

by lining it up with the 2 points on the cards The same needle and syringe are kept for repeated use in the delivery of antigen emulsion and unless re-used immediately, each is carefully washed and dried

In performing the test, the inactivated serum is delivered to the glass slides in the usual manner and after several of these slides have received their full load of serum specimens, they are placed on a small wooden tray as illustrated in figure 2 The calibrated syringe and needle adjusted to the required angle is loaded with antigen emulsion The first few drops to form are discarded and then in succession, a drop is allowed to fall into each successive "slide well" until each has receiv

a drop of antigen emulsion This is accomplished by moving the loaded tray under the point of the needle The ring stand holding the syringe and needle is not moved during the period of use and is touched only during loading While loading the apparatus the needle tip is either covered with a bit of absorbent material or the emulsion is allowed to drip into a Petri dish to prevent soiling the top of the workbench

Coarsening of the antigen particles due to evaporation and exposure to air does not appear to occur The technic used for mixing the antigen emulsion remaining in the syringe with fresh antigen emulsion has proved satisfactory and no demonstrable change in the sensitivity or accuracy of the test from this cause has been detected

In our hands the described technic constitutes a reproducible method of delivering accurate quantities of antigen emulsion in the VDRL test and eliminates one source of technical error

BOOK REVIEW

Ameb is P th l gy D gno d Ch m th py by *H m lto H A ders* M D Pr f or d Chairma Ph rm c l gy d E pe me tal Th pe ti Th S ho l f M d i U r ity of C l for M d c l Ce t Sa Fr c Cal f Dea f th M d al Faculty Am t U i ty f B ir t B rut L ba 1950 1951 *Warr L B t ck* M D A soc t Pr f or f P th l gy D partme t f P th l gy The Sch l of M d Uni ty f Cal f t ia M d al C nte S Fr ncis o Cal f d *H b t G J bn t* Ph. D P f or f P ra tol gy Par t logy d Myc l gy Section of th D partme t f Med c Th Sch l f M d ne Uni ty of Cal for M dic l C t r Sa Fran c o Cal f 431 pag llust t d Ch l C Thom P bl h r Sp gf ld Ill 1953 Pr c $11 50

This monograph deals with its subject in a systematic and detailed manner There is an extensive section on laboratory diagnosis and laboratory technic The authors stress the importance of iron hematoxylin stained preparations in stool examinations and point out the many difficulties inherent in laboratory diagnosis Each chapter closes with a summary followed by a bibliography There is an excellent section on extraintestinal amebiasis Much of the book is of little clinical interest. Although it contains much material of practical value this is essentially a reference book —*Comdr H E Reitz MC USN*

INVERTING PROCTOSCOPIC TABLE

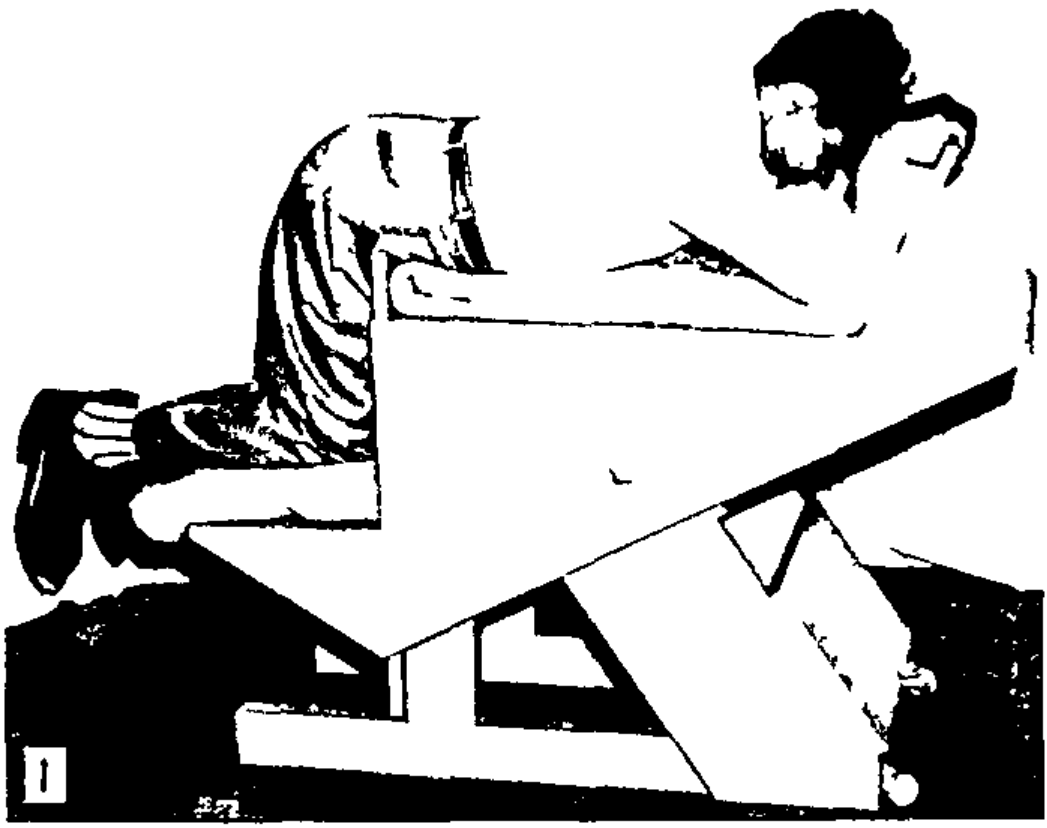
VICTOR C TUCKER *M D* (1)

IT is generally conceded that most cancers of the colon arise from adenomatous polyps and that most of the polyps are within reach of the sigmoidoscope In this area, many people have one or more pinhead to pea sized polyps most of their lives, just as they have moles on their skin I have removed pea sized polyps from 6 persons in whom the pathologic diagnosis was adenocarcinoma, grade I or higher In 4 of these patients, the solitary polyps were removed 10 years ago There has been no recurrence to date in any of the patients followed A removal of this type of polyp is a simple office procedure if performed on a proper table with the proper equipment

The inverted position has done more to advance sigmoidoscopic examination than any other single factor except the development of the electrically lighted equipment With the patient in the fully inverted position, the rectum opens without the necessity of forced air in most patients With careful sigmoidoscopy in the inverted position (visualizing the lumen as the instrument is advanced), there is little danger of injury to the intestines Most perforations of the colon from sigmoidoscopic examinations occur with the patient in the Sims position or in a knee chest position on a flat table To obtain a satisfactory inverted position of the patient, a tilting examining table is necessary Hanes is credited with discovering the advantages of the inverted position in proctology, and Buie introduced a number of improvements over the Hanes table which are of great practical value

A pharmacist's mate in the Navy on Guam built a proctoscopic table of packing-case lumber from drawings I furnished him which proved as practical as some models costing about $1 000 We used it frequently, because many of our personnel, as well as many natives had acute amebiasis in addition to the usual run of rectal and colonic conditions so frequently encountered in the military service We examined a number of patients for nearby naval hospitals which did not have facilities for satisfactory sigmoidoscopic examinations at that time The table was so satisfactory that I had one built of plywood (figs 1 and 2) for my extra examining room when I returned to private practice I have since furnished 6 more tables, built of standard plywood, to different local charity clinics and hospitals I believe

(1) Consultant in Proctology Brooke Army Hospital Fort Sam Houston Texas



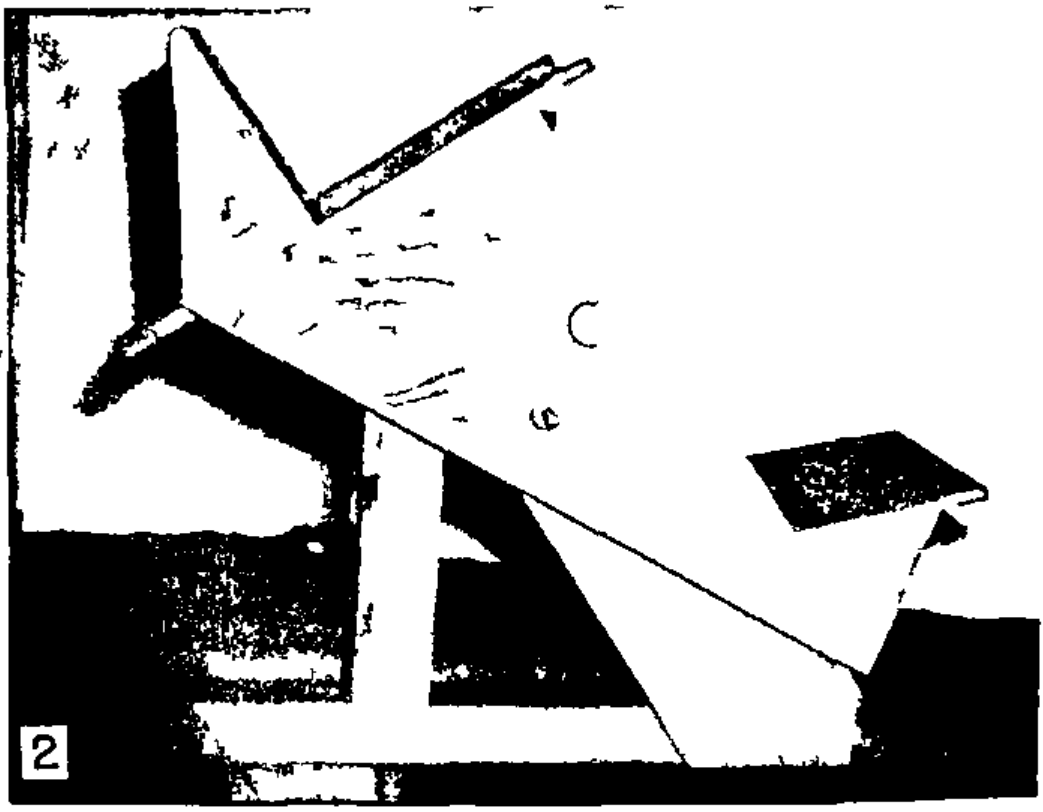


Figure 1 Table flat Figure 2 Table fully raised

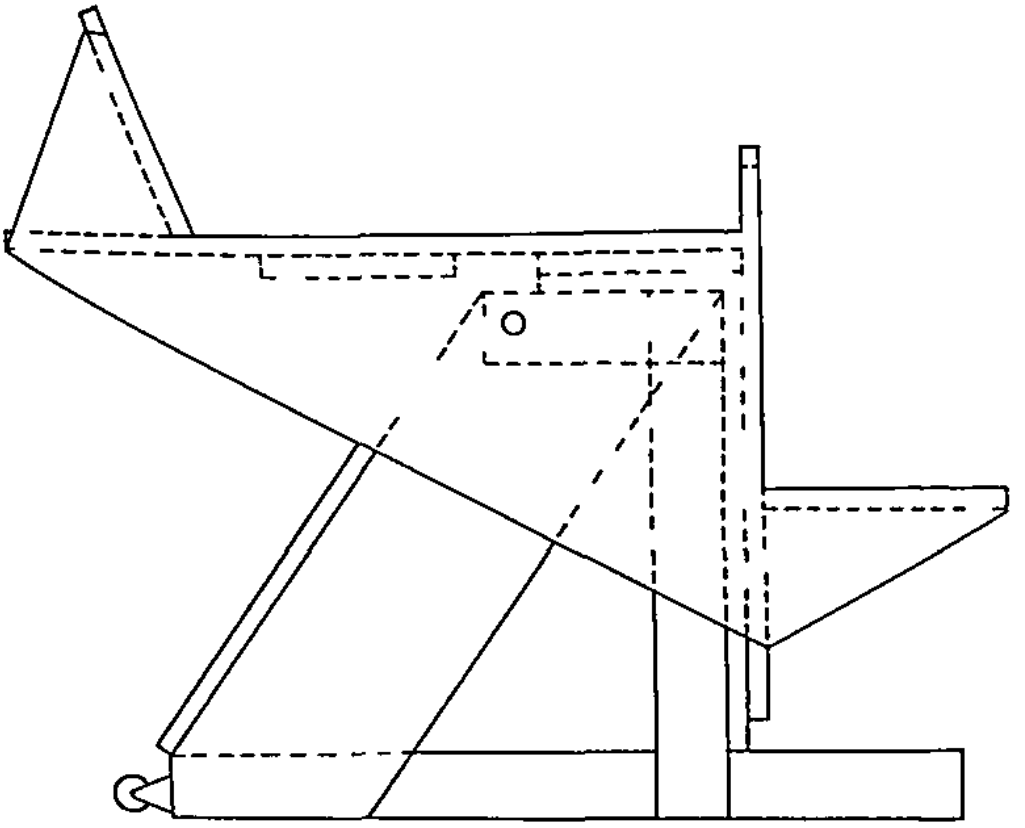
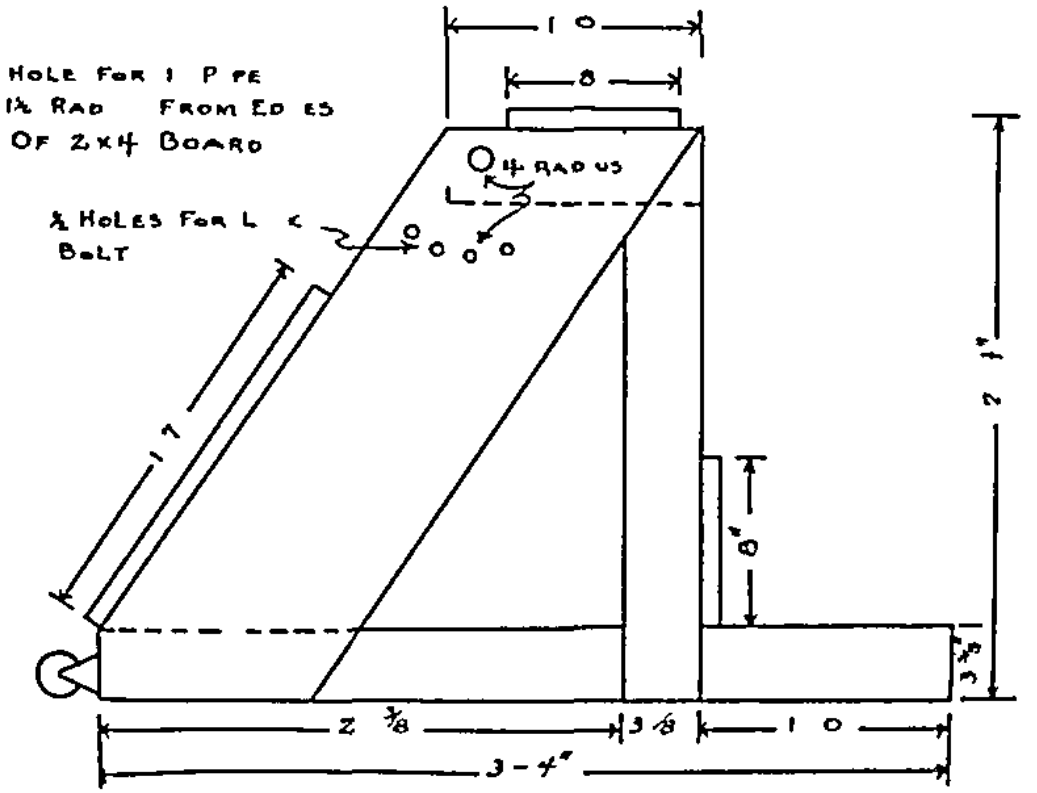


Figure 3 Inve ting p octoscopic table



Figu e 4. Inne s pporting ection

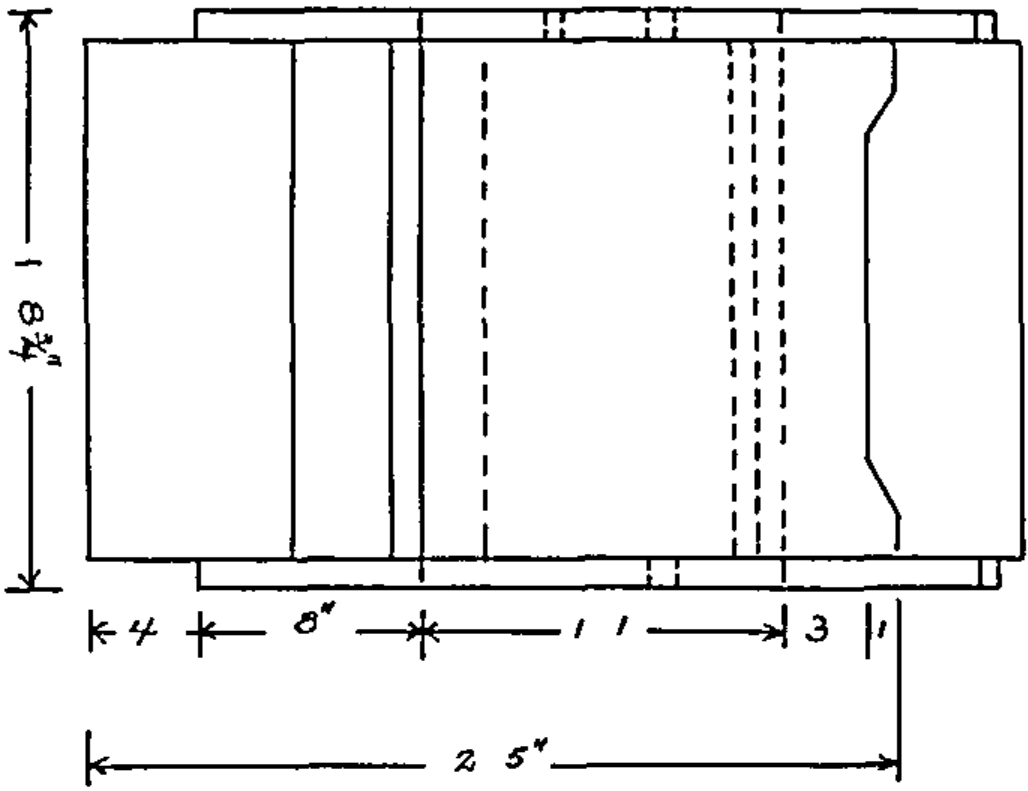


Fig 5 Oblique projection (from above).

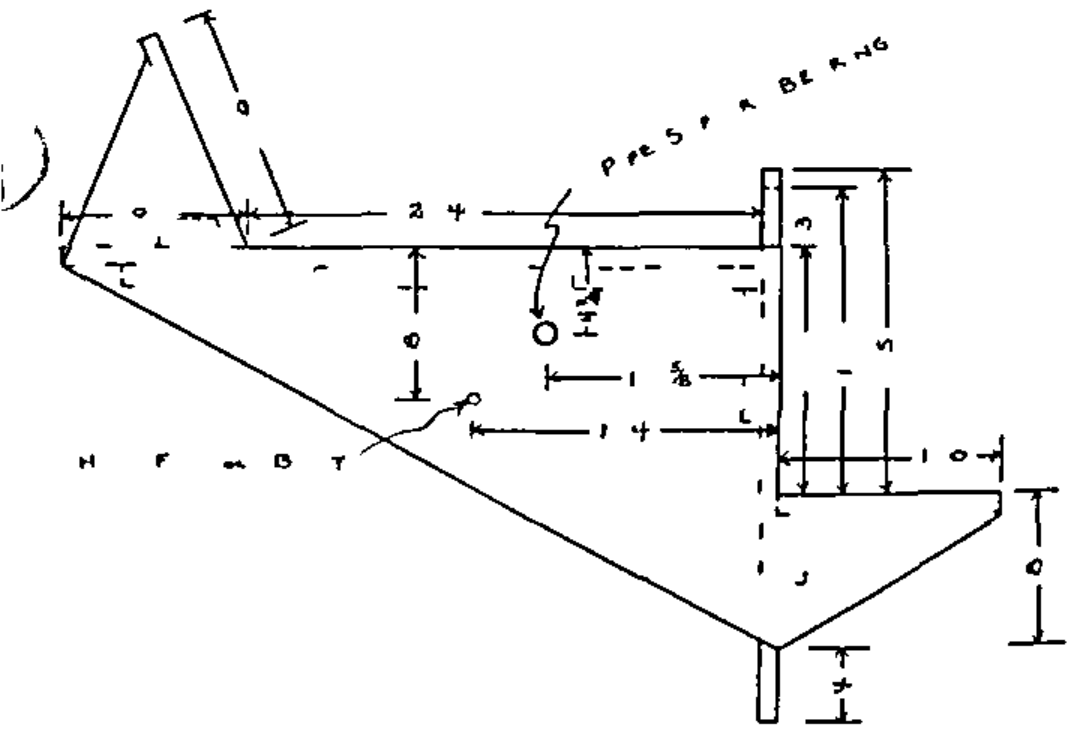


Figure 6. Oblique projection (side view)

myself, which shows that no special skill is required The material cost about $15 per table, not counting padding We used an old navy blanket folded lengthwise for padding on the table in Guam and army surplus cushions on most of the tables constructed in this community This table can be made to tilt to any desired degree It is modeled after Buie's modification of the Hanes table Details of its construction are shown in figures 3 6

BOOK REVIEWS

A Manual of Oral Surgery A Step-by Step Atlas of Operative Technics 643 pages illustrated and A Manual of Dental Anesthesia An Illustrated Guide for Student and Practitioner 192 pages illustrated by W *Harry Archer* B S M A D D S Professor of Oral Surgery and Anesthesia School of Dentistry University of Pittsburgh Head of the Department of Oral Surgery School of Dentistry Lecturer School of Nursing and School of Public Health University of Pittsburgh Chief of the Dental Department of the Magee Hospital Oral Surgeon and Chief of the Dental Department of the Western Psychiatric Institute and Clinic Senior Dental Staff Member of the Eye and Ear Hospital Senior Consultant in Oral Surgery at the Veterans Administration Hospital Chief of the Dental Department of the Falk Clinic Diplomate of the American Board of Oral Surgery Fellow of the American College of Dentists and Fellow of the International College of Anesthetists W B Saunders Co Philadelphia Pa publisher 1952

These 2 books are valuable additions to dental literature They will serve well as textbooks for students and as reference books for practitioners I like the clear and concise way in which Dr Archer has presented his material His coverage is complete and to the point Hence a certain operative procedure can be quickly reviewed without wading through voluminous material

My only objection to the books is that the size and type of print of the captions for the illustrations differ very little from the text This is frequently confusing and some pages are difficult to read without getting lost

One of the main advantages of these books is that they contain current information, particularly in the field of antibiotic pre and post operative drugs, et cetera

In *A Manual of Oral Surgery* the author devotes the first portion to a thorough discussion of the general concepts and te-

nics of exodontia He then devotes chapters to such special subjects as apicoectomy, preparation of the mouth for dental prosthesis by surgery oral infections treatment of oral cysts and tumors fractures, et cetera Certain chapters were contributed by outstanding authorities

In *A Manual of Dental Anesthesia* Dr Archer presents a brief account of the history of anesthesia followed by sections on local and general anesthesia The newest local anesthetic agents in use today are discussed The answer to almost any question concerning local anesthesia which might arise can be found in this book A special chapter dealing with complications associated with *general* anesthesia is contributed by another author —*Capt R W McCue USAF (DC)*

Dise s of the H art and Arter e A at m c l and F ct onal Di turb nc s f th Circ lation Tre tme t by *G g R H rrmann* M S. M D Ph. D F A C. P Prof or of Medic U v rs ty of Te Dir ctor of th Cardiov cul Serv s d H art Stat U i er ty H p t l Co s ltant V ular D s s U ted Stat Mari Hospit l Cons l nt in M d cine t Su g on General U it d St te Army 4th d t on 652 pages llustr t d Th C V Mo by C St Lou Mo. publ h 1952 Pr ce $12 50

This new edition of a standard manual of cardiology incorporates the new developments in the field during the 8 years since the last edition appeared The book is an outgrowth of many years of practice teaching and research by an outstanding clinician The book contains new material on embryologic development of the heart and the principles of phonocardiography electrokymography tomography and cardiac catheterization The chapters on congenital heart disease and valvular heart disease have been expanded Over 100 new illustrations have been added The section on electrocardiography has been completely rewritten Old material has been effectively condensed and the author has achieved his goal of preparing a text in as simple succinct and concise a form as possible Altogether the book contains a surprising amount of material for its size even though it has outgrown the original pocket-sized manual format The bibliographies are brief and contain only the most pertinent references The section on peripheral vascular disease is short An unusual feature of value to physicians in the Armed Services is the chapter on military cardiovascular examinations and interpretations The appendix contains chapters on the diagnosis and common errors in the diagnosis of heart disease and correction of cardiovascular deformities by surgical procedure This remains one of the best texts available to students of cardiology —*Col B E Pollock MC USA*

RADIOGRAPHIC TABLE FOR HIP OPERATIONS[1]

ROBERT W AUGUSTINE *Lieutenant Colonel USAF (MC)*
WALTER E LANDMESSER JR *Captain, USAF (MC)*
MERVEL V PARKER *Captain USAF (MC)*
WILLIAM R. MacAUSLAND JR. *First Lieutenant USAF (MC)*
LEE W SHAFFER JR. *First Lieutenant USAF (MC)*

A TABLE for operations on the hip and upper femoral shaft was developed to provide for efficient positioning and roentgenographic examination of the patient. Existing tables have given inconsistent and often unsatisfactory results when used for hip operations because the pelvic rest does not

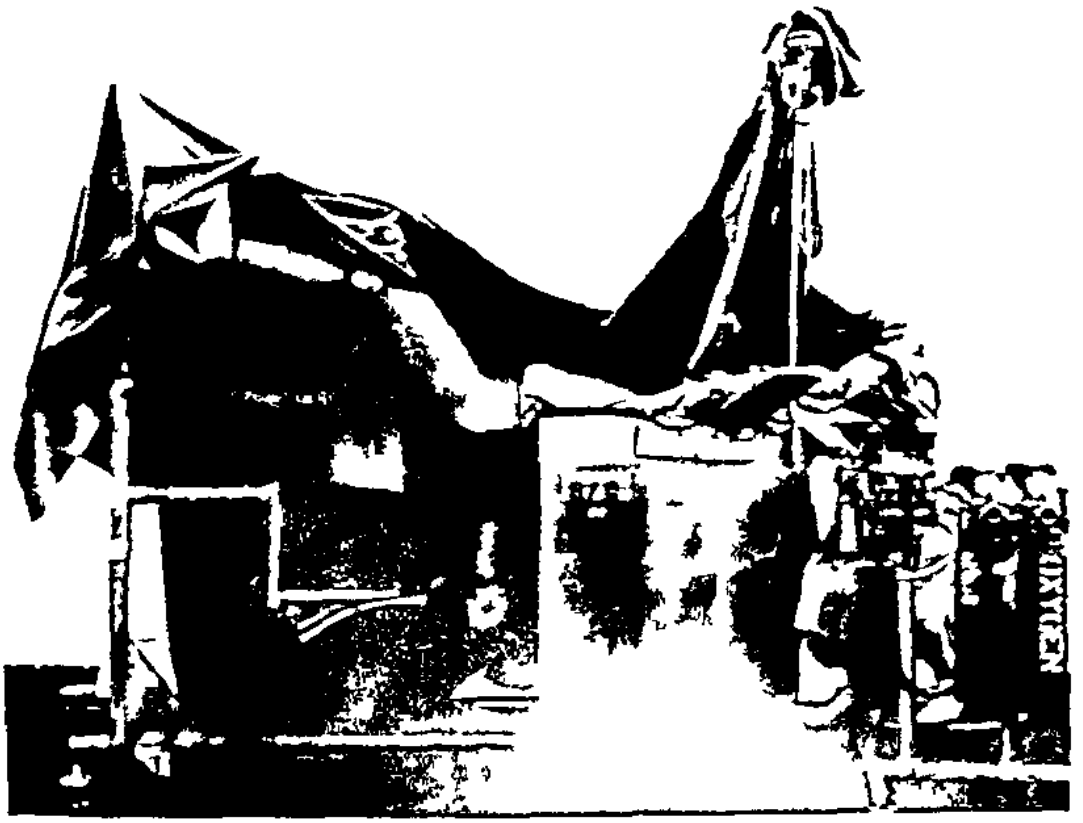
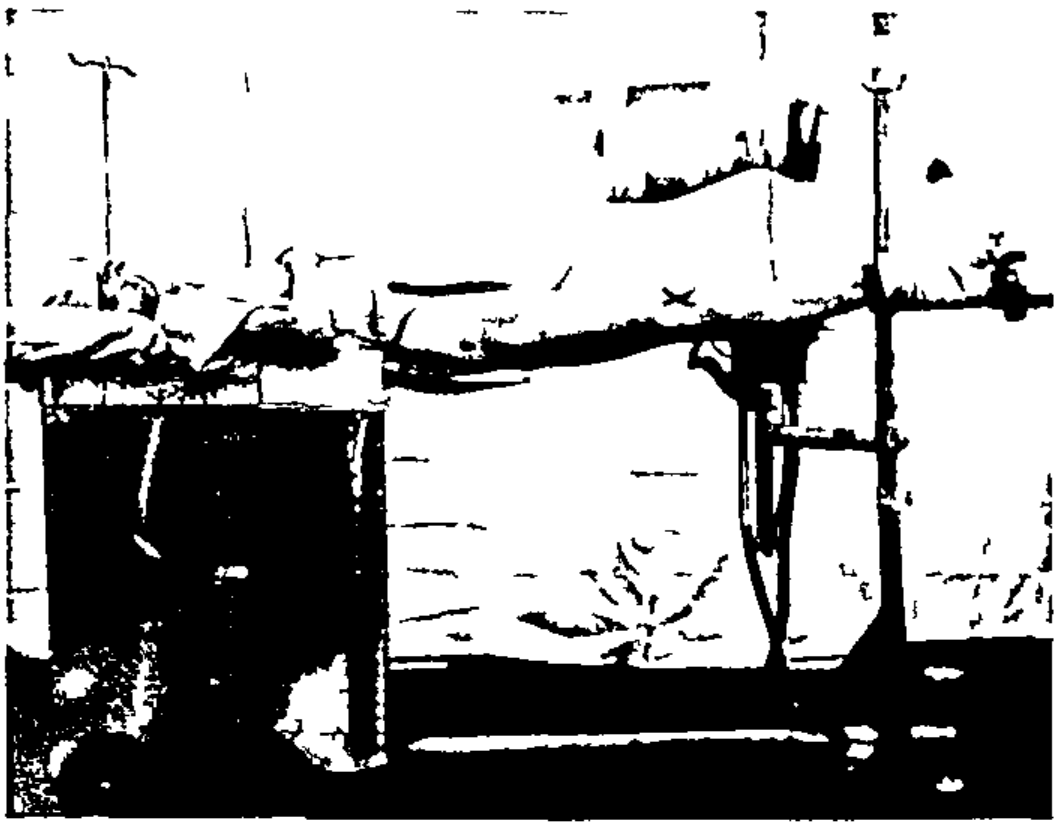


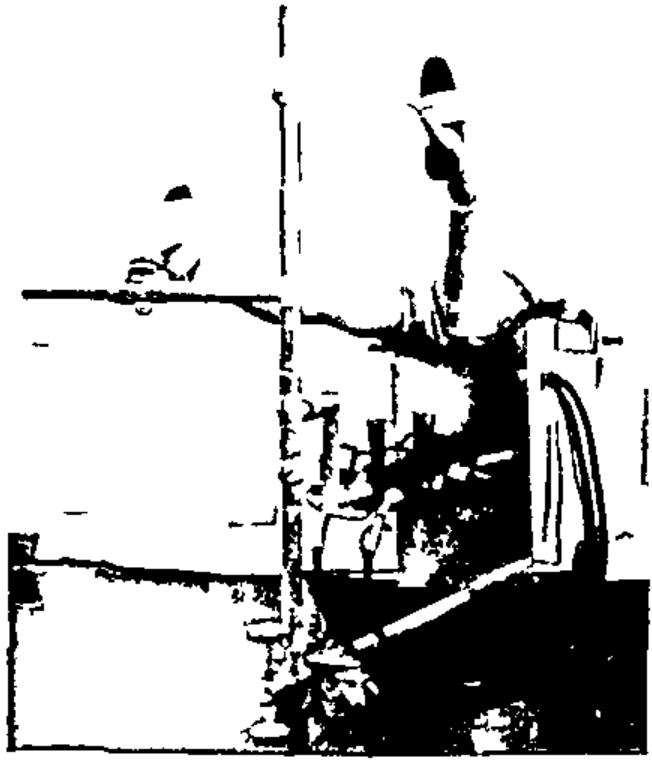
Figure 1 Lateral view of table with patient draped and in position for operation on hip X ray tube head is fixed for posteroanterior view The right (operative) extremity is held in footplate on compound-lever bar left leg is suspended overhead to permit lateral roentgenographic views without moving patient. Arm board intravenous stand and adequate working room for anesthetist are provided. Combined on floor lock and elevating device at foot of machine permits Trendelenburg positioning if needed.

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[1] From U S Air Force Hospital Malcolm Grow Air Force Base



Figur 2 Later l u f t bl with patie t posit o for op t on and x ray tube head fixed for f gl g l t al v u Not use f shoe to liminat p ur on he l uben foot is t d nto footplat o t cti ba



F gur 3 Fbot g pb hou x-ray t po t on for poste oa t ior iew o/ ght f mur N t xt nstn glut al pport u h ch help to t bil e patie t The elevati g floor lock pe rit us f T nd l b g po itio sp t 15 / a ed

stabilize the patient, is uncomfortable, and does not provide x ray facilities This table is designed for one specific purpose and is constructed of standard and readily obtainable components It has the following advantages over the standard fracture or operating table (1) adequate, comfortable support for the patient without danger of pressure over the sacrum or need for bulky padding, (2) patient positioning permitting consistent, satisfactory roentgenographic (particularly lateral) views by the average technician, (3) incorporation of a roentgen unit in the table to permit posteroanterior and lateral views of the hip and femoral shaft without moving the patient



Figure 4. View of table showing transformer incorporated into body of table Patient is in position for operation on right hip X ray tube head is set for posteroanterior view of hip

The body support of the table was molded of plastic over a model of the human back and buttocks Excavation of the sacral area of the plastic support reduces the pressure on this area that occurs on the pelvic rests in conventional tables The pelvic post is designed to impinge on the adductor muscles rather than on the perineum to give the patient greater comfort Traction may be applied to the involved extremity by means of a compound lever bar The other leg is suspended from an overhead bar to allow a frogleg positioning for a lateral roentgenographic view

An x ray field unit (30 milliampere) is incorporated into the table so that the technician can swing the head into position for either posteroanterior or lateral views of the hip or upper femur without moving the patient. Once the proper exposure is determined, consistently good lateral and posteroanterior views

can be obtained Incorporation of the x ray transformer into the body of the table gives it stabilizing ballast.

The table is designed particularly for nailing the femoral neck and for intertrochanteric fractures It can also be used for insertion of the Rush pin, the application of bone plates and/or bone grafts to the upper shaft and for the insertion of hip prostheses from the anterolateral approach The patient can be placed only in the supine position and once positioned is secure and comfortable The table also has arm boards a holder for an infusion flask and a device to permit Trendelenburg positioning (Fig. 1 to 4)

BOOK REVIEW

Practical Clinical Chemistry A Guide for Technicians by *Alma Hill* Ph D Associate Attending Biochemist Chargé of Clinical Chemistry Presbyterian Hospital of the City of Chicago Associate Professor of Biological Chemistry University of Illinois College of Medicine Chicago Illinois 266 pages Charles C Thomas Publisher Springfield Ill 1953 Price $6 50

This monograph presents a guide for 24 biochemical procedures in clinical diagnostic technics covering the usual routine requests made by physicians Each determination is first described in detail including the preparation of solutions technic of procedure and calculations, then is given in outline for convenience of laboratory operation these outlines are removable and appear in a separate group in the back of the book on perforated pages that the same may be detached placed in a transparent cover and used by the technician during the course of the procedure Additional information is extended in general laboratory procedures covering precautions specimens quantitative solutions the preparation of standard solutions and the use and care of photometers and spectrophotometers Tables which cover various topics such as the blood volume necessary for a specific procedure carbon dioxide combining capacity of the plasma et cetera are included The procedures presented are well established and accepted Modifications have been made in some instances over the original published method in the interest of simplicity and economy of time without sacrifice of accuracy This book should be of interest to persons working in or directing the average diagnostic laboratory

—*Maj W H Lee USAF (MSC)*

THERAPEUTIC PNEUMOPERITONEUM

EDMUND C CASEY *First Lieutenant USAF (MC) (1)*
KENNETH W CLEMENT *Major USAF (MC) (2)*

IN 1872, the recovery of a patient with tuberculous peritonitis was credited to pneumoperitoneum Since then this procedure has been used in the treatment of many diseases and as a diagnostic aid Pneumoperitoneum in pulmonary tuberculosis was reported first to have been accidentally observed during the injection of pneumothorax in conjunction with oxygen therapy in a patient with tuberculous peritonitis Clinical reports (3 4) appearing in the literature 20 years ago established the value of pneumoperitoneum in the treatment of pulmonary tuberculosis

THEORETICAL CONCEPT

The rationale for the use of pneumoperitoneum lies in the creation of a positive pressure within the abdominal cavity which elevates the diaphragm This permits the lungs to contract and promotes healing Greater relaxation can be affected if phrenic nerve interruption follows the pneumoperitoneum (5) A few years ago this combined procedure was used, but with the advent of streptomycin and new surgical procedures, crushing of the phrenic nerve is less acceptable today We believe that a diseased area of the lung can be placed at rest only if the surrounding tissue is elastic In the chronic or fibroid types of pulmonary tuberculosis, when elastic tissue has been replaced by fibrous tissue, the results are poor Pleural and peritoneal adhesions which limit the movement of the diaphragm contribute to the therapeutic failure of pneumoperitoneum

INDICATIONS

Minimal or moderately advanced acute exudative disease respond well to pneumoperitoneum If the disease process extends to the periphery of the lung making the use of pneumothorax inadvisable treatment by pneumoperitoneum is indicated

vanced tuberculosis *(6 7)* pneumoperitoneum may be used prior to thoracoplasty, lobectomy or pneumonectomy Tuberculous pneumonia may be temporarily stabilized by the simultaneous use of streptomycin and pneumoperitoneum Hemoptysis may be controlled by pneumoperitoneum The spread which occasionally accompanies hemoptysis resolves under pneumoperitoneum Pneumoperitoneum is the treatment of choice in tuberculosis following thoracoplasty or lobectomy

When development of fluid failure of the disease to resolve persistent cavitation or pleural adhesions which cannot be severed cause pneumothorax to fail pneumoperitoneum helps control the disease A partial pneumothorax may be supplemented by a pneumoperitoneum to produce a satisfactory collapse

Pneumoperitoneum can be given safely during pregnancy until the seventh month of gestation air can be reintroduced 7 or 8 weeks postpartum The tonicity of the abdominal muscles may be regained by exercise to accomplish a satisfactory collapse

Pulmonary tuberculosis with pleural effusions responds better to pneumoperitoneum than to fluid air replacement because the pneumoperitoneum minimizes the probability of the development of empyema, pleural thickening and incarcerated lung

COMPLICATIONS

Air embolism is a serious but rare complication of pneumoperitoneum *(8)* The incidence is greater during the first procedure especially when air is introduced on the right side Because of the number of organs in the right upper abdominal quadrant the introduction of air into the circulating blood stream is more likely than when the procedure is done in the left upper quadrant The symptoms are referred to the area where the greater accumulations of air in the vascular system occur Pentylenetetrazol, nikethamide caffeine and sodium benzoate, epinephrine either intravenously or subcutaneously, and oxygen, usually by pressure mask are useful in treatment

Hernias in the abdominal wall may complicate pneumoperitoneum Treatment may be resumed from 6 to 8 weeks after surgical repair

Accidental pneumothorax may develop When this occurs the site of the initial pneumoperitoneum should be lower on the abdomen so that the pleural reflections will not be injected

(6) M bell R S H t J S J od McCain P P P um pe on m trea me t f pulm nary be l r lts 710 f om 1937 1946 Am R T be 55 306-331 Apr 1947

(7) S mmond F A H Air-emb l m nd pneumomedia t um f l poc mope on um. La t 1 530-533 Ap 13 1946

(8) W ring F C. J od Th ma R M Sp neou ir mbol m bs rv d i

Mediastinal emphysema *(9)* usually occurs during 1 of 2 stages of treatment by pneumoperitoneum The first is immediately after the initial procedure and is probably due to a defect in the diaphragm near the vertebral column The second is when refills are being made at high pressure This requires no specific treatment

Subcutaneous emphysema during treatment is usually due to improper placement of the needle Only rarely does a gap causing leakage of air into the subcutaneous space occur in the peritoneal surface Except for slight discomfort, this complication is of no consequence

When peritoneal effusion develops *(10)*, cultures of the fluid usually are sterile Discontinuance of pneumoperitoneum is rarely indicated unless a massive peritoneal effusion produces a positive culture for tuberculosis in guinea pigs

Abdominal pain of from several hours to 3 days duration may occur The patient soon becomes accustomed to the presence of air in his abdomen Pain in the shoulders following the initial injection disappears in a few hours Air in the colon has been observed, and produces flatulence Anuria has not been noted Anorexia may occur because the appetite is partially satisfied by the presence of air in the abdomen, but eventually the patient will become hungry

SURGICAL ABDOMINAL DISEASES

In 1950 Rack and Clement *(11)* became interested in the effect of pneumoperitoneum on the development, recognition, treatment, and prognosis of acute surgical abdominal diseases They analyzed the case records of 9 patients who developed a surgical abdomen while undergoing pneumoperitoneum Because these 9 patients all were operated on, the development of the disease, the pre and post operative diagnoses, and the subsequent morbidity and mortality could be studied This series included 4 patients with perforated peptic ulcers, 3 with acute suppurative appendixes, and 1 each with an incarcerated inguinal hernia and a ruptured tubal pregnancy The history of these patients was compared with those of patients not being treated with pneumoperitoneum Four additional patients (2 with appendicitis and 1 each with acute pancreatitis and perforated duodenal ulcer) have been observed

(9) T mbl H G Eat J L Cr ash u G L nd Gourl y I Pn umope toneum in tr tm t of p lmonary t be ul 407 cons c ti e a s Am. Re Tuberc 57 433-4 0 May 1948.

(10) Cornwall \ C. d Pat dg W H Ca f f tal per ton l h monbag com lr cat g art f c l poe m per ton m. T be le 28 164 165 Aug 1947

(11) Ra k F J nd Cl me t K. W E per w h cut urg c l abdomen in pr a of th pe c pneum per t neum port of c Surgery 28 896-902 Nov 1950

No clinical or laboratory findings which *differed from* those of the patients without pneumoperitoneum were noted in the patients whose diseases developed while they were receiving pneumoperitoneum In the patients with inflammatory diseases who were receiving pneumoperitoneum the omentum failed to act as a barrier to the spread of suppurative material as it commonly does in patients with similar inflammatory conditions but who are not being given pneumoperitoneum No localized abscesses were found in the patients with pneumoperitoneum Because of this apparent alteration in normal intraperitoneal defenses observed at operation, early surgical intervention is imperative in the presence of symptoms and signs suggestive of the acute surgical abdomen

TECHNIC

The skin near the left costal margin is cleaned with iodine and alcohol The necessary equipment includes a 1½ inch short beveled No 19 needle a 2 cc syringe, and a pneumothorax apparatus filled with carbon dioxide The skin subcutaneous tissue and muscles are infiltrated with 2 percent procaine solution The No 19 needle is placed in the abdominal wall and aspiration is attempted with the syringe The needle is then attached to the pneumothorax machine and a positive pressure of from 20 to 30 cm of water is created Then the needle is slowly pushed through the subcutaneous tissues until the pressure is suddenly dispelled by a small amount of air escaping into the peritoneal cavity This space having been found can be filled with from 200 to 300 cc of carbon dioxide followed by from 700 to 800 cc of room air Fluoroscopy should be performed immediately after this initial procedure to insure that the space under the diaphragm was filled The same technic is used in refilling, but after 4 or 5 times the procaine can be eliminated The frequency of refills varies but is usually twice weekly for 3 weeks and once weekly thereafter The amount varies from 600 to 800 cc or more depending on the ease with which the diaphragm is pushed upward The intraperitoneal pressures may vary from plus 4 to 20 cc of water without discomfort to the patient

CONCLUSION

Because pneumoperitoneum can be instituted early and safely and maintained with greater facility than pneumothorax it is recommended as an adjuvant in the treatment of pulmonary tuberculosis when indicated

MYOBLASTOMA OF THE TONGUE

JAMES E CHIPPS *Lieutenant Colonel DC USA (1)*

GEORGE R REINHARDT *First Lieutenant MC USA (1)*

MUSCLE tissue tumors of the tongue are rarely encountered clinically The lesion in the patient here reported preoperatively closely resembled an early carcinoma of the papillomatous type

CASE REPORT

A 22 year old man was referred for treatment of a small painless mass along the lateral border of his tongue He had first noted the lesion 3 months earlier There had been no noticeable increase in its size Two weeks earlier the surface had broken down was painful for a few days, then apparently healed On examination a slightly elevated mass 1.3 cm in diameter was observed along the mid border of the tongue It was circumscribed and the surface was slightly cauliflowered and yellow The mass was firm, extended into the tongue to a depth of about 1 cm , and was apparently fixed to the tongue musculature Examination of the dental arch showed a moderate malocclusion with overbite A mandibular first molar had been extracted 3 years earlier and when the tongue was at rest, the lesion lay adjacent to the space created by the extraction The patient was not, however, conscious of dental trauma or of biting or sucking habits associated with the lesion

The patient was presented at a tumor conference Because of its distinctly circumscribed localization some of the staff believed the lesion to be a benign papilloma or fibroma or merely a scar secondary to dental trauma but the majority including ourselves, thought that the distinct surface markings indicated a lesion of epithelial origin and that the apparent extension into the tongue and fixation indicated an early malignant invasion The patient was scheduled for excision biopsy and frozen section microscopy If a diagnosis of carcinoma were returned it was thought that considering the patient s age, a radical removal of adjacent tissue such as hemiglossectomy, would be justified

Under general anesthesia a wedge shaped section of tongue containing the lesion was excised the incisions beginning about 1 cm from the margins of the lesion and converging to join at

(1) Tokyo Army Hospital

about the center of the tongue Hemorrhage was controlled and the wound was packed The specimen was referred to the pathologist No positive diagnosis was obtained by a study of the frozen section but the pathologist stated that the mass did not appear to be an epithelial malignancy The wound was then closed It healed uneventfully without evidence of a lingual defect.

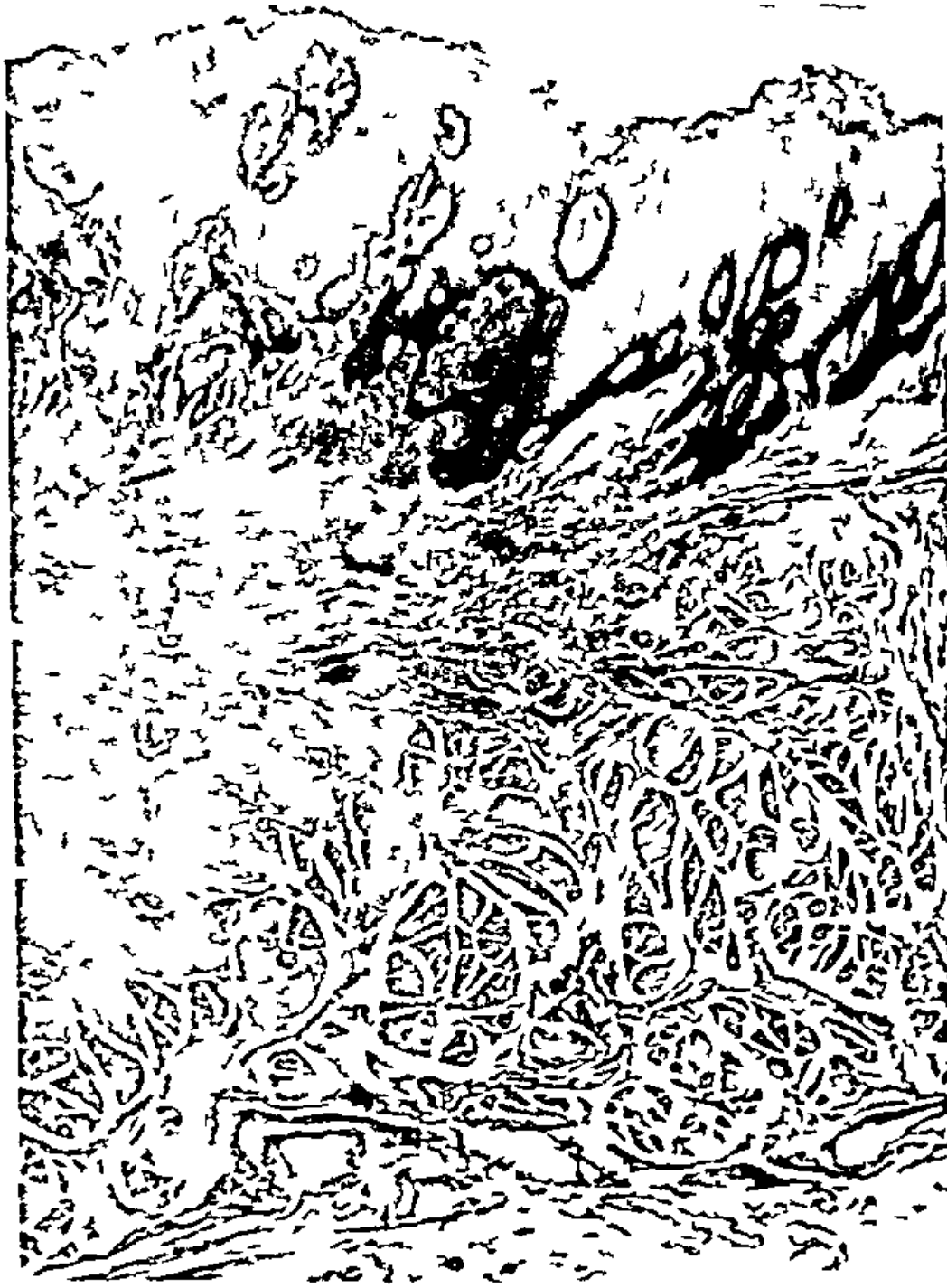


Fig 1 Photomicrograph (X 32 8) showing irregular cell masses with hyperplastic epithelium. At the periphery the cells gradually become longer and assume a striated and blended with muscle fibers while the latter blend with muscle bundle

After studying stained sections (fig 1) the pathologist made a diagnosis of benign myoblastoma The sections showed an irregular hyperplasia of the mucosa with a loss of detail but no break in continuity of the basal layer Under this was a tumorous growth of large, round, granular cells mixed with an occasional elongated striated cell and a few muscle fibers Muscle fibers were more numerous near the periphery of the mass and gradually blended with the adjacent normal bundles of striated muscle

DISCUSSION

Rhabdomyomas, believed to be formed from mesenchymal cells destined to develop striated muscle, occur in various types Ward and Hendrick *(2)* stated that the term myoblastoma is used, perhaps wrongly, to describe the granular cell type (1) which is composed of round and elongated cells which may or may not be striated, (2) which is not encapsulated, and (3) which is believed by some observers, particularly Willis *(3)* to be the result of direct injury to muscle fibers and not to be a true tumor Although apparently benign, the lesions have recurred after incomplete excision Bernier and Ash *(4)* remarked on the hyperthrophy of the overlying epithelium to the point of resemblance to squamous cell carcinoma The lateral border of the tongue is stated to be the most common site of origin, but even so, the lesion is rare Thoma *(5)* found only 21 cases of rhabdomyoma of the tongue reported in the literature

In our patient the presence of the lesion adjacent to the space created by an extracted tooth and an associated malocclusion are compatible with the theory of traumatic etiology No doubt, the history of a breaking down or "ulceration" of the surface of the mass indicated fresh trauma

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(2) Ward G E and Hendrick J W Diagnosis and Treatment of Tumors of Head and Neck Not Including Central Nervous System W Williams & Wilkins Co Baltimore Md 1950

(3) Willis R A Pathology of Tumours C V Mosby Co St Louis Mo 1948. p 743

(4) Bernier J L. and Ash J E Atlas of Dental and Oral Pathology Prepared at the Army Institute of Pathology from Material in the Registry of Dental and Oral Pathology of the American Dental Association 4th edition of previous editions of James B Mann and Henry M. Goldman Americ Registry of Pathology National Research Council and Army Institute of Pathology Washington D C 1948. p 166

(5) Thoma K H. Oral Pathology 2d edition C V Mosby Co St Louis Mo 1944 p 1073

about the center of the tongue Hemorrhage was controlled and the wound was packed The specimen was referred to the pathologist No positive diagnosis was obtained by a study of the frozen section but the pathologist stated that the mass did not appear to be an epithelial malignancy The wound was then closed It healed uneventfully without evidence of a lingual defect



Figure 1 Photomicrograph (X 32 8) showing granular cell mass beneath hyperplastic epithelium Note the perpheral cells gradually becoming elongated and staining and blending with muscle fibers which is two blending with muscle

CONGENITAL PITS ON THE VERMILION PORTION OF THE LOWER LIP

GEORGE W WADE *Lieutenant junior grade DC USNR (1)*

CONGENITAL fistula of the lip is a rare deformity seen more commonly in the lower than in the upper lip It may be associated with other malformations such as harelip, cleft palate, or clubfoot Treatment is seldom necessary, but if the appearance is objectionable or there are annoying secretions it is possible to remove the fistula by electrocoagulation or complete surgical excision

Ludy and Shirazy (2) reviewed the few cases reported prior to 1938 and listed a comprehensive bibliography

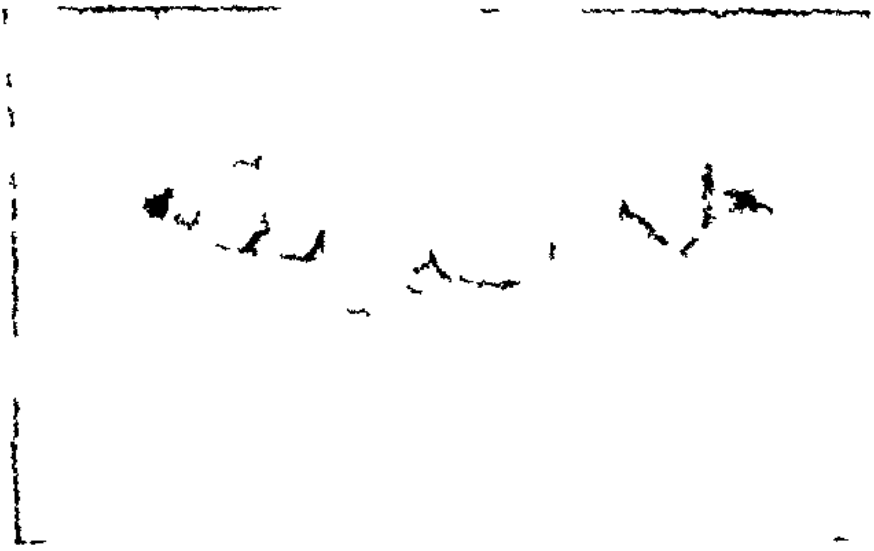


Figure 1

CASE REPORT

A 19 year old Navy recruit on routine dental examinations was found to have 2 large nonsecreting pits on the vermilion portion of his lower lip Neither his parents nor his 12 year-old sister had a similar condition The pits were symmetrically located one

on each side of the midline (fig 1) They were elliptically shaped The one on the right had a mesiodistal diameter of 10 mm and a depth of 4 5 mm the one on the left had a diameter of 7 mm and a depth of 3 5 mm No communications of any kind were found There was no secretion or history of secretion from these pits The patient had no other apparent congenital anomaly

The patient wished to have these pits removed because of the enlargement of his lower lip Under 2 percent procaine anesthesia an incision was made with scalpel to the depth of each pit and each was removed in toto with a small amount of the normal adjacent tissue The lips of the wounds were undermined slightly and the tissue brought together and held with interrupted sutures Terramycin paste and tincture of benzoin were applied On the first postoperative day the patient was given cacao butter to lubricate the area Healing was uneventful all sutures were removed on the fifth day and the patient was returned to full duty

Comment No hereditary background was apparent in this case Examination revealed no other congenital deformity There was no history of a mucous secretion from these pits Surgical removal was made at the request of the patient for cosmetic reasons only

BOOK REVIEW

Th Pharynx B c A p ts nd Cl l P obl m edited by *Ab ham R H ll d* M D F A C. S Profe t f Ot l ry g l gy Em t *U ty f Ill C ll g of M d c Atte d g Ot l ryng l gist* d Ch m f th S rv M t Sin Hospit l f G e t r Miam Co lt g Ot lary gol g t Var ty Childre s Hosp t l M m d St. F Il p t l Miam B h Fl 560 pag ill t t d The Y B k Publ h Inc Chi g Ill p bli h 1953 P ic $15

Dr Hollender and a well qualified group of collaborators have presented the medical profession with an outstanding treatise to each division of which the editor has given a comprehensive and valuable analysis This gives the book an individual touch frequently lacking in present-day compilations All phases of pharyngeal disease as well as the anatomy and physiology of the tissues concerned are discussed This book is up to date and the latest technics of therapy and surgical management are described The Pharynx" is recommended as a text and reference book to all physicians who have occasion to diagnose or treat lesions or diseases of this area All otolaryngologists and pediatricians should benefit by perusal of this work and the general practitioner should find it invaluable as a reference manual —*Capt D A Hoxie MC USN*

SURGICAL MANAGEMENT OF PERITONSILLAR ABSCESS

BENJAMIN L. HARRISON *First Lieutenant USAF (MC)* (1)

THE surgical management of peritonsillar abscess often taxes the diagnostic and therapeutic ability of the laryngologist as well as of the general practitioner (2). A brief review of the important etiologic and diagnostic factors in this condition and a technic to facilitate its recognition is here presented (3-5).

Symptoms and signs. The temperature is variable, ranging from 99° F. to 103° F. Pain may be excruciating, and may be referred to any part of the neck on the same side and to the ear. The pharynx presents a unilateral tonsillar and peritonsillar swelling which tends to push the uvula to the opposite side. The mucosa may vary in color from bright orange-red to a cyanotic blush. Trismus is usually present and the mouth cannot be opened more than 1 or 2 cm. A tongue blade on end can often be inserted between the teeth to increase the aperture. Dysphagia may be so severe that saliva drools from the mouth. Fetor oris is usually present.

Diagnosis. Trismus makes it difficult to determine when an abscess is ready for incision because it prevents palpation, although palpation, even by an experienced laryngologist, is often misleading. The proper time for incision is frequently missed, leading to (1) thrombosis of the internal jugular vein, edema of the larynx, pharyngomaxillary abscess, vascular erosion with hemorrhage, or, (2) spontaneous rupture of the abscess, usually at a site which will soon close off, or (3) premature incision.

Antibiotics and prompt local management account for the infrequency of complications (6, 7). When an abscess ruptures

(1) U. S. Air Force Hospital, Biloxi Air Force Base, La.

(2) Race, W. D.: Incision of retropharyngeal phlegmon, peritonsillar abscess and parapharyngeal abscess, Med. Clin. North America 24: 760-777, Aug. 25, 1940.

(3) Iglauer, S.: Anatomico-pathological studies of retropharyngeal (parapharyngeal) abscess, Arch. Otolaryng. 33: 31-44, Jan., 1941.

(4) Shaskan, H. P.: Symposium on infectious diseases of the ear, nose and throat, Clin. North America 34: 1621-1635, Nov., 1950.

(5) Shirahashi, S.: Experimental Study on Peritonsillar Abscess, Oto-rhino-laryng. 14: 407, Jun., 1941.

spontaneously reoccurrence is frequent A premature incision is painful and may lead to an extension of the infection

Management The anterior surface of the tonsil involved is sprayed with a 20 percent solution of cocaine \ ° inch large bore needle (No 19 or lower) on a tuberculin type of syringe is inserted into the swelling in an attempt to aspirate its contents If liquid pus is obtained the abscess is ready for incision If no pus is obtained, from several points incision is contraindicated The trauma caused by the needle and the pain suffered by the patient is minimal

When the peritonsillar mass is fluctuant and liquid pus is obtained with the syringe incision and drainage is indicated The site of the incision is the area where pus was found when the syringe was used Thorough evacuation of the pus can be accomplished by insertion of an ordinary metal suction tip into the incision Under direct vision the extent of the abscess cavity can be determined In searching for pus the needle should be directed backward and laterally A penetrating exploration must be avoided because of the vital structures lying posterolaterally to the tonsillar capsule

CASE REPORTS

Case 1 A 24 year old woman was first seen on 30 December 1952 because of sore throat and pain in her left ear of 24 hours duration A diagnosis of peritonsillar abscess was made She was given penicillin and advised to use hot irrigations Trismus was marked on the following day and an incision and drainage was attempted She was well until 7 February 1953 when she reported for an examination that revealed a left peritonsillar swelling Exploration with a No 19 bore needle failed to yield us but there was a sensation of fluctuation Moderate trismus developed on 9 January and 1 5 cc of foul smelling pus was obtained on exploration Incision and drainage of the abscess was performed and the cavity was sucked dry and packed with iodoform gauze Recovery was uneventful and tonsillectomy was performed about 4 weel s later

Case ⁰ \ 19 year old man reported at sick call on 4 January 1953 complaining of sore throat and inability to swallow or open his mouth Examination revealed marked trismus drooling of saliva a moderate right peritonsillar swelling and a fetid odor

(6) Cap B P i ll od pe osilla b w h pe al f u me t w th ll nam d mp d Ar h Ot lary g 38 210-224 Sept 1943

(7) N l H. G t l S ud h umat f b rv t nsill f h m lyti u p oc ll f t os ll t my d dm t of pe ll h uma od mh ma f pa] laf Dis 83 138-146 Sep O 1948.

to breath The mouth was slowly pried open until a tuberculin syringe carrying a 2 inch, No 19 needle could be introduced, but no pus was found Penicillin was prescribed, and the procedure was repeated on 5 and 6 January with the same results One half cubic centimeter of pus was obtained by aspiration on 7 January, and incision and drainage was performed The dysphagia disappeared at once and the trismus was partially relieved The patient made an unremarkable recovery

BOOK REVIEWS

The Metabolism of Protein Constituents in the Mammalian Body by *S J Bach* 272 pages Oxford University Press New York N Y publishers 1952 Price $9 25

The author has achieved a monumental treatment of the metabolism of a carefully selected group of amino acids (glycine, serine, threonine, valine, leucine, isoleucine, cysteine, cystine, and methionine) Unity of purpose of the volume is inherent in the diversity and the complexity of the metabolism of each of the amino acids chosen for major consideration Alanine is not omitted, but the space accorded to it is very brief This is consistent with the comparatively simple metabolism of that compound Each of the remaining amino acids mentioned is dealt with exhaustively It is projected that additional protein constituents will be considered in a forthcoming volume

The reader emerges with a detailed view of the metabolic complications associated with the presence of specific chemical configurations within the amino acid molecule This applies to the hydroxy group (serine), sulfur (cystine), the methylated thiol group (methionine) and branched carbon chains (the leucines and valine) The participation of glycine in the synthesis of the porphyrins, uric acid glutathione, and bile acids has led the author to include a wealth of physiologic information concerning these latter compounds Similarly, data concerning the methyl group of methionine is expanded to include a detailed discussion of the phenomenon of transmethylation, the biosynthesis of the methyl group the nutritive aspects of labile methyl groups and the site of transmethylation within the organism The author s treatment of the physiologic and pathologic significance of tran methylation includes an extended discussion of "

compounds exhibiting lipotropic activity It is this character of *additional* information which extends the value of the book beyond the realm of the protein chemist into the range of interests of the physiologic chemist and the clinician

—Lt Col T J Domanski USAF (MSC)

J Mell Ophth Im c Surgery A Ha dbo k of Surgic l Oper t ons on the Ey ball nd It Appe d g 6th d t on Re t d d l tg d by Prof o Dr *J B k* w th S pplement by *K Koll* Tr l t d nd d ted by *Ray K. Da ly* M D F A C S and *L s Da ly J* B S M D Ph D (Ophth) F A C S 529 pag s illustr t d The Blak ton Co N w York N Y p bl h s 1953 P c $12

Unfortunately this text has not been brought up to date It contains much of the wisdom of the original author and has many *timely suggestions for an ophthalmic surgeon whether he be a* novice or a man of much experience In chapter 1 there is an illustration showing the use of Weber s knife to incise the lower *canaliculus This procedure is obsolete and should not be men* tioned in modern textbooks The section on lacrimal-duct and larcimal sac surgery is somewhat confusing because of the numerous procedures mentioned and a failure to describe the advantages and disadvantages of each The section on surgery of the extraocular muscles is particularly poor and inferior to the texts which are available in this country Again mention is made of free tenotomy of the medial rectus muscle This procedure should be discarded The section in which the Kronlein operation is discussed is particularly poor A much better saw than the old handsaw and wire saw illustrated in this text is now available There is also a better approach as was shown some time ago by Reese In the section on cataract extrac tion it is hard to understand why space was wasted in the dis cussion of how to remove a cataract with finger pressure Another section states that when there is a prolapse of the vitreous *no attempt should be made to reposit the iris* I inferred from this that the lids are to be closed and the eye is to be left to its own devices This advice was acceptable when preplaced sutures were not used I believe that much can be done in pre venting serious complications following prolapse of the vitre ous after firmly embedded sutures have been tied The chapter on operations for ptosis is confusing and lists many opera tions which work poorly in trained hands and disastrously in the hands of those who operate only occasionally

—Col M J Reeh USAFR (MC)

A NEARLY FATAL REACTION TO SULFOBROMOPHTHALEIN[1]

JOSEPH M DiCAPRIO *First Lieutenant MC USAR*

PHILIP TROEN *Captain, MC USAR*

THE sulfobromophthalein test provides accurate and useful information regarding hepatic function and is widely used Reports of severe reactions to this dye are rare *(2 3)* This case report of a nearly fatal reaction should, therefore, be of interest

CASE REPORT

A 33 year old man entered this hospital on 14 January 1952 His history, physical examination, and laboratory findings were all compatible with a diagnosis of infectious hepatitis His general condition was good A sulfobromophthalein test was performed to provide an index of the degree of impairment of his liver function The patient weighed 169 pounds and was of average build He was given 7 7 cc (5 mg per kilogram of body weight) of a 5 percent solution of sulfobromophthalein intravenously The full amount was given in about 45 seconds Just as the needle was withdrawn from the vein, the patient became very pale, lost consciousness, developed obstructed breathing, and had several clonic convulsive movements of his head There was no cyanosis The entire episode lasted about 1 minute Treatment with oxygen was immediately started When the patient regained consciousness, he was able to speak lucidly He acted as if he had just been aroused from a deep sleep He had no recollection of what had happened but felt weak and dizzy His pulse was strong and regular with a rate of 44 His blood pressure was 110/70 His respirations were irregular and usually quite deep with a rate of about 7 His lungs were clear His heart sounds were of good quality He had a left lower facial paresis A Babinski sign was present on the left His abdominal and cremasteric reflexes were absent His ankle jerks were bilaterally hyperactive Four hours later, he felt much improved and his pulse rate was 100 his blood pressure was 90/60 his

(1) From the U S Army Hospital Kobe Japan

(2) Council on Pharmacy and Chemistry of the American Medical Association New and Nonofficial Remedies 1947 J B Lippincott Co Philadelphia Pa 1947 p 315

(3) Chambers W N and Mast F C Bromsulphalein reaction Am J Med Sc 305-310, Aug 1948

respiratory rate was 10 per minute but still irregular Oxygen therapy was continued and shock blocks were used An ECG was normal During the next 6 hours, his pulse blood pressure and respiration returned to normal and therapy was discontinued Twenty four hours after the episode he felt well except for weakness but an absent gag reflex and minimal left lower facial paresis persisted On the following day he was asymptomatic At no time did he develop urticaria fever or chills There was *no* allergic background He had never previously received sulfobromophthalein Injections from the same lot of dye had been given to other patients without ill effect The patient s recovery from the infectious hepatitis was otherwise uneventful Two months later his gag reflex was still absent and minimal left lower facial weakness was detectable He stated that since his hospitalization he was frequently awakened from his sleep at night by an accumulation of secretions in his throat

DISCUSSION

Although sulfobromophthalein is generally regarded as a fairly innocuous agent from the above account and other reports *(3 6)* it is apparent that its use may be attended by serious consequences The presence of an allergic history is not necessary As a practical solution to the problem we repeat the suggestion of others *(3 6)* that the dye be administered slowly Less than 1 cc of a 5 percent solution should be given slowly and the patient observed for about 5 minutes for any untoward reaction If there is none the remainder of the dose may be given slowly It is hoped that this procedure will at least reduce the severity of a reaction

(4) Mor y G Gabuzd G J nd Scudamor H H Se rz t br ms lphal i (phe l br mph hal in-disod um If mat). Ga troe l gy 13 246-249 Sept 1949

(5) Roth J L A Anaphyla id ti t lf br m ph hal od um J A M A 145 802 803 July 1 1950

(6) d And A M. J nd McK ow J J J U usual ic on t br m-lph le Ann In Med 34 1265-1269 May 1951

TRIPELENNAMINE IN VARICELLA

ROBERT B KALMANSOHN *First Lieutenant MC USA (1)*

SINCE the original description of varicella by Ingrassia in 1553, this diagnosis has offered little difficulty to the average physician Because of its relative innocuous nature, however, the disease has elicited little interest from the therapeutic standpoint As a result, the tendency has been to prescribe a soothing lotion which has given varying degrees of symptomatic relief

In the past 2 years, we have treated many adult male soldiers with varicella and have been impressed with the degree of their discomfort We have employed conventional medications locally, including calamine lotion, menthol, phenol, antihistaminics, and various combinations of these drugs without consistent antipruritic results For that reason we have recently tried from 50 to 100 mg of tripelennamine citrate by mouth q i d on about 15 patients, and have been impressed with the rapid and complete relief from itching obtained in every case With proper spacing of the dosage, relief has been complete around the clock in all stages of the disease No attempt was made to evaluate the effect of this antihistaminic on the course of the disease because of the variable natural course

(1) U S Army Hospital Fort Bel oir V

Dental Note

Control of Setting Time for Zinc Oxide Eugenol Paste

DUE to climatic and other conditions, occasionally it is found that the zinc oxide eugenol impressions set either too fast or too slowly It has been found that water in minute amount (1 or 2 drops) is a powerful hastener for the setting time and glycerin (3 to 6 drops) is a retarder for the setting time The water or glycerin should be added to the rosin-eugenol containing (dark) part of the paste, and mixed thoroughly before the zinc oxide (light) part of the paste is added Such a procedure insures a homogeneous distribution of the additive The exact amount of water (1 or 2 drops) or glycerin (3 to 6 drops) to be added should be determined by trial

BOOK REVIEW

F m li l Nonre g ic Food All rgy by *A thur* F *Coca* M D Or dell N J with c tr bur ons by *Conrad Be* M D New York N Y *Ed th L.* C *mm g* V ll y Cott ge N Y *Lou J G d* M D New York N Y *L ona d S. G* L L B New York N Y *Al J bnston* M D Pla f ld Ind *A thur P Locke* Ph D New Brun w ck N J *M lo G M y* M D Mich g City Ind *M Murray P zbk n,* M D New York N Y nd *S mm P* M D Honol l T H 3d ed t on 279 pag s illustr t d Charles C Th mas P blishe Spr gfield Ill 1953 Pric $10 50

This text deals with a new concept of allergic disease It is based on the assumption that 80 percent or more of the population is suffering from clinical allergies of a nonreaginic type The author states that this condition is hereditary of lethal character and can be detected only through the observations of the effect of substances on the pulse rate The principal symptoms attributed to this form of allergy are hives headaches heartburn indigestion canker sores in the mouth dizziness constipation nervousness, neuralgia, chronic rhinitis abnormal tiredness hay fever asthma and hemorrhoids He also states that such conditions as hypertension epilepsy irritable colon, peptic ulcer, ulcerative colitis retinal angiopathies paroxysmal tachycardia angina pectoris emotional instability and depression multiple sclerosis hemorrhoids pruritus ani and vulva myalgias and glaucoma may be caused by this condition

In the past the concepts presented in this book have not met with support from the medical profession The number of patients studied by the author are relatively few and his results are nothing short of miraculous The material is presented in a rather dogmatic and uncompromising fashion leading the reader to believe that most medical diseases can be controlled by the technics outlined in the book Caution should be exercised in adopting concepts so radical as those presented until further confirmation of their work is demonstrated through scientific investigation

—*Lt Col A J Berger MC USA*

BOOKS RECEIVED

Encyclopedia of Aberrations A Psychiatric Handbook edited by *Edua d Podolsky* M D State University of New York Medical College With a Foreword by *Alexandra Adler* M D New York University College of Medicine 550 pages illustrated Philosophical Library New York N Y publishers 1953 Price $10

Psychiatric Treatment Proceedings of the Association December 14 and 15 1951 New York N Y With 49 illustrations and 62 tables Research Publications *Associat on for Research in Nervous and Mental Disease* World List Abbreviations Res Publ Ass nerv ment Dis Volume XXXI Editorial Committee *S Berna d Wortis* M D Chairman *Morris Herman* M D and *Cla ence C Hare* M D 451 pages illustrated The Williams and Wilkins Co Baltimore Md publishers 1953 Price $9

Ménière s Disease by *Henry L Williams* M D M S in Otol Head of Section of Otolaryngology and Rhinology Mayo Clinic Professor of Otolaryngology and Rhinology Mayo Foundation Graduate School of University of Minnesota Rochest r Minnesota American Lecture Series Publication Number 129 A Monograph in the Bannerstone Division of American Lectures in Otolaryngology Audiology and Broncho-Esophagology Edited by *Norton Canfield* M D Associate Clinical Professor of Otolaryngology Yale University School of Medi cine New Haven Conn 349 pages illustrated Ch rles C Thomas Publisher Springfield Ill 1952 Price $7

Comroe s Arthritis and Allied Conditions edited by *Joseph Lee Hollande* M D and collaborating editors *Nathan R Abrams* M D *Victor G Balboni* M D *Edward W Boland* M D *Ralph H Boots* M D *Morris A Bouie* M D *Howard C Coggesball* M D *Richa d H Freyberg* M D *Wallace Grabam* M D *W Paul Holb ook* M D *John G Kuhns* M D *John Lansbury* M D *Theodore A Potte* M D *Cha les Ragan* M D *Edua d F Rosenberg* M D *Cha ley J Smyth* M D *Philip D Wilson* M D and *Philip D Wilson, Jr* M D Com pletely Revised and Rewritten 5th edition 1 103 pages 399 illus trations Lea & Febiger Philadelphia Pa publishers 1953

From the Workshop of Discoveries by *Otto Loewi* Research Professor of Pharm cology New Yo k Un versity College of Medicine Porter Lec tures Ser es 19 62 pages University of Kansas Press Lawrence Kans publishers 1953 P ice $2

Clinical Endocrinology Vol me I and II by *Leu is M Hurxthal* M D F A C P He d of the Department of Internal Medicine Lahey Clinic Bo ton Physici New England Baptist and New E gland Deaconess Hosp tals Bo ton and *Natal ja Musulin* B S M D Staff of Cooper Hosp tal Camde N J Volume I 749 pages Volume II 850 pages 482 f gu s 146 charts 1 color plate J B Lippincott Co Phil delph a Pa publ he s 1953

Pr bl m in Dental Local A esth a by M nd l N D D S Forme Oral Su g G e p t ll pital F mer Or l Surg o ll p tal f-e D fo m t a d Jo t D C ltant A e th t st O H ll Mem r l Ho pital P st P s d t K g C ty De tal Soci ty Auth r Co d ct Infiltrat d G r l A th a l De t t ry Ed Mod D t t y Thi vol m w s p p d f om or g al mat al omp l d by D Mend l N n, wh ch was r sed d d t d ft h s de th by Hill d R N v D D S 760 pag ill tr ted D t l l m of I t t P bli hing C I B ookly N Y p bl she 1952

Pr g Cl c l P y h l gy Volum I (S ct n 1) d t d by D l B ow r Ph D d Law e e E Abt Ph D 328 page Gru & Stratto N w Y rk N Y p bl her 1952 P $5 75

Pr gt s in Cl cal Psych l gy Volume I (S ct 2) d t d by D l B ow r Ph D d Law e E Abt Ph D 235 pag Gru & Stratt N w Yo k N Y p bl h r 1952 P $5

P c pl nd T ch q e of E odo ti by F k W nd ll Ro nd A B D D S S D (H) Lat D t l S rg t Brook llo p tal Co t y Staff Phillip H us Mas ch tt G ral Ho p tal D plomate Am B d f O l Surg s P t Pr d t of th A can S ty f Oral S g nd f tl Am ri n A d my f D t l S Fo m ly Pr f f Oral S g ry d A sthesi L ill Coll ge of D nt try d Ch rl Eld R nd A B D M D A t t D t l S g n M s ch tt Ge ral H pit l V t ng I stru to in O l S gery T ft Dent l S ho l 407 p g s ill trat d Th C V M by C St L s Mo p bl h 1953 P e $10

P th l gy of th H rt dit d by S E G ld M D D Sc Cl c l Pro- f o f P th l gy W y U t ty Coll g of M dici D tr it M h P thol g t W y e C ty Ge eral H p tal Elo M h C lt t in P th logy V t r n Adm strati H p t l De bo M ch Ed t Am n J ur l of Cl c l P th l gy 1 023 pag s ll trat d Ch rl C Th ma P bl h r Sp gf ld Ill 1953 P $25 50

H tory of An th s w th mph th t pec li t by V g ia S That h Edit Am c n A t o f Nurs A sth t t P bl t 289 p ge ll trat d J B L pp tt C p bl sh r Ph l d lph P 1953

D g t T t N r logy A S l t for Off U by R b t W t n- b g M D Fo w d by S r G d H lme M D F R S d St ley T ma M D 228 pag ill trat d Th Ye B k P b- l h l Ch cago Ill p bl h r 1953 Pr e $4 50

Th R ddl of Ca by Ch l Ob l g M D tra l ted by W lliam H Wogl m M D R d d ti 238 p ge Y l U ity P N w H C p bl h 1952 P i $5

The F unde of Neurology O e H dred nd Thirty-Th e B ogr phic l Sketch P pa d for th F urth I ter t on l N ur l g c l Co g s P r by 84 th s Ed t d by W bb H ymak M D Ch f N uro- p th l gy S ct Arm d Forc I t t te of P th l gy W h gton D C W th th b bl gr ph cal d d torial t c of Ka l A B B bl gr ph Army M d l L br ry W sh gt D C 479 p g s ll str t d Ch l C Thom P bli h r Spr gf eld IlL 1953 Pr $10 50

H w to Be He lthy Hot Climate by El T C l ley M D 2d d on

The Psychopathic Delinquent and Criminal by *Geo ge N Thompson* M D F A C P Associate Clinical Professor of Neurology and Psychia try School of Medicine University of Southern California Los Angeles Calif Formerly Chief of Psychiatric Service Los Angeles County General Hospital Psychiatric Consultant Department of Corrections State of California Fellow of the American Psychiatric Association Fellow of the American Academy of Neurology 157 pages illustrated Charles C Thomas Publisher Springfield Ill 1953

The 1952 Year Book of Dermatology and Syphilology (December 1951 Novem ber 1952) edited by *Marion B Sulzbe ger* M D *Professor* and Chairman Department of Dermatology and Syphilology New York University Post Graduate Medical School Director of Dermatology and Syphil ology Skin and Cancer Unit and *University* Hospital *New York Uni* versity Bellevue Medical Center and *Rudolf L Baer* M D Associate Professor of Clinical Dermatology and Syphilology New York University Post Graduate Medical School Associate Director Skin and Cancer Unit and Attending Dermatologist New York University Hospital 444 pages illustrated The Year Book Publishers Inc Chicago Ill publishers 1953 Price $6

Functional Disorders of the Foot Diagnosis and Treatment by *Frank D Dickson* M D F A C S Clinical Professor of Surgery University of Kansas School of Medicine Orthopedic Surgeon St Luke s Kansas City General and Wheatley Hospitals Kan as City Mo and Prov i dence Hospital Kansas City Kan and *Rex L Diveley* A B M D F A C S As istant Professor Orthopedic Surgery University of Kansas School of Medicine Chief Orthopedic Consultant Veterins Administration Washington D C Chief Orthopedic Surgeon Kan as City General Hospital Orthopedic Surgeon, St Luke s and Wheatley Hospitals Kansas City Mo and Providence Hospital Kansas City, Kan 205 figure numbers 3d edition 345 pages illustrated J B Lippincott Co Philadelphia Pa publishers 1953

Hypersplenism A Clinical Evaluation by *Cyrus C Sturgis* M D Chairman of the Department of Internal Medicine, Professor of Internal Medicine and Director of the Thomas Henry Simpson *Memorial Institute for Me lical* Research University of Michigan The Benumont Lecture Wayne County Medical Society January 21 1952 American Lecture Series I ul licati n Number 175 A Monograph in American Lectures *in Me licine* 97 *pages* illustrated Charles C Thomas Publisher Springfiel l, Ill 1953 I r $3 25

Immunity Hyperse nsiv ty *Serology by Sidney Raffel* Sc D M D I e fe r of Bacteriology Department of Bacteriology and I xperin ental I ml l py Stanford Univer ty S hool of Medici e 531 p r illustr t l Appleton Century Crofts Inc New York N Y publi l e 1953

Renal Cortical Necros s and the Kidney of Concealed Accidental H emorrh ge by H L *Sheeha* D Sc M D F R C. I I R C O (nn l H (Moo e M D Depa tme t of P thology U er ity of Liverpool I ngland American Lecture Series I ubl c t on Numb r 167 A *Monograp l n* Th Ban erstone D vision of Ameri n Lectu in Circulatio I ited by *In ne H Page* M D Cle el d Clin c Cleveland Ohio nd A C Corco an M D Clev l nd Cli ic Cle el nd Ohio 186 *pages* Il trated Charles C Thom s Publ h r Spr ngf eld Ill 1953 I ric $

Operative Gynecology by *Richa d W Tel d* Professor *of Cyn ecol* John H pk ns Un ersity and Chi f Gynecolog st *Johns H pk* Hospital d edit o 002 pag s Illu t ted publ h rs 1953 Pr ce $20 J B

A Short Practice of Surgery by *Ham lt B ley* F R C S. (E g) F A C S F I C. S F R S E Eme t Surg on Royal Northe n Hospital Lond S n or Surgeon St V ncent s Cl c nd th Italia H sp t l Form ly Ext rn l Ex mi t Surg ry U er ity f Bri t l nd *R J McNe ll Lov* M S (Lo d) F R C S. (Eng) F A C. S. F I C S Surge Roy l North rn M ldmay M on nd Metr p l ta H p tals Consulting S rg City of Londo Matern ty H p tal C nsult g Surgeon Pott r B r H sp tal A oc t for Ge ral Surg ry We t E d Hosp t l f N rv D s M mber f C uncil nd Court f Exam Er mu W lson Demon trator a d Hunt ia Prof s or Roy l Coll ge of Surge n P th l g l Ill strat ns by *L C D H m tt* M B Ch B (Ed), Pathologist Roy l Infirmary Sh ffield 9th ed tio (65th th us nd) with 1 234 ll tr t ons of wh ch 272 colored 1,254 p ge ill tr t d Th Williams & Wilkins C B lt mor Md publ h r 1953 Pr e $12 50

The Gr i Block Substitution T st for Me suri g Orga ic Brain Pathology by *Jo pb R G a* A B M A Dir ctor of Cli c l P y hol gy As ta t Pr f s of Clin c l P ychol gy Bowm Gr y Sch l of Medic W ke F re t C ll g W n t n-S l m N C. Am r c L tur S s Public t on Number 149 A M nograph in Amer c L ctur I Psych logy d t d by *M lly Harr w* Ph D R arch d C ulting P ychol gist N w Yo k N Y 75 p ge llust t d Ch rl C Th m s Publi h r Sp i gf ld Ill 1953 P c $3

Mod rn Tre tment A G ide fo Ge l P ct by 53 thors Ed t d by *A t Sm th* M D Ed tor of th J ur al of the Am an M d c l A oc tion and *Paul L. W m* M D S cr t ry Committee on R ear h Am ic M d l A ociati l 146 page llu tr ted P l B Hoebe Inc New York N Y p bli h rs 1953 P ic $20

BOOK REVIEWS

Liver Injury, Transactions of the Eleventh Conference April 30 and May 1 1952 New York N Y edited by *F W Hoffbauer* M. D., Associate Professor Department of Medicine University of Minnesota Hospitals Minneapolis Minn Sponsored by the *Josiah Macy Jr Foundation*, New York N Y Printed by Corlies Macy & Co Inc New York N Y., 1953 Price $4

This comprehensive and instructive book deals with infective hepatitis, enzyme activity in the human liver morphology of the liver the mechanism of biliary excretion in mammals, and hepatic histochemistry It is intended primarily for participants in medical research but is also of interest and value to the internist and to the gastroenterologist A few of the sections that were of special interest to me were the discussions of allergic manifestations associated with infective hepatitis, the study of immunity in infective hepatitis in relation to gamma globulin, and the discussion of the development of cirrhosis of the liver This book includes several excellent colored as well as black and white figures

—*Col U P Wertheargas MC, USA*

An Atlas of Skull Roentgenograms by *Bernard S. Epstein*, M. D. Associate Radiologist The Jewish Hospital of Brooklyn, Brooklyn, N Y and *Leo M. Davidoff* M D Neurosurgeon to the Mount Sinai Hospital New York N Y and Director of Neurological Surgery the Beth Israel Hospital New York N Y 415 pages illustrated. Lea & Febiger Philadelphia Pa publishers 1953 Price $15

The authors of this volume have succeeded in compiling an excellent atlas of roentgenograms of the skull Emphasis is placed on plain views illustrating the various conditions that can be recognized It deals with the normal skull, variations in the congenital anomalies effects of trauma, infections, brain tumors, tumors of the vault, and non neoplastic diseases of the skull Pneuroencephalography and cerebral angiography have been omitted because the authors believe these have been adequately described elsewhere The reproduced roentgenograms are well chosen and of good quality Each has a concise descriptive legend The text is adequate and is adorned with a pleasing lack of verbosity The volume is recommended as an excellent reference book for the library of the roentgenologist

—*Comdr W W Mason MC, USN*

Y B k f Ey Ea N se d Th oat (O t ber 1951 Sept mbe 1952). Th Ey d t d by *D rr k Vail* B A M D D Oph (Ox) F A C S F R C S (Ho) Prof d D cto D p ment f Ophth lm l gy N thw ter U t ty M dical School Att nd g Ophth lmologi t P va t M m l Il sp tal P st Att nd ng Oph th lm log t Cook Cou ty H pital Th Ear No d Th oat d d by *J h R L d y* M D P f r f Ot l ry gol gy U ty f Chic g th S h ol f M d 455 pag s *Illustrat d* Th Y r Book P blish I c Ch c g Ill 1953 P 1 $6

This Year Book summarizes the current American and European literature for the designated period It is an excellent and timely reference book There is a great deal of current interest in retrolental fibroplasia About 20 percent of the section on the eye deals with this condition New knowledge of the anatomy of the eye results of treatment with new drugs recent advances in ophthalmic surgery and prostheses and newer concepts of physiologic and pathologic processes involving the eye are well summarized

The newer concepts of neurology related to the ear nose and throat and to diseases of the cranial nerves various author s conclusions concerning surgical treatment of otosclerosis the new drugs used in otolaryngology and new otolaryngologic operations are well summarized The subjects of plastic surgery and maxillofacial injuries are conspicuous by their absence from this publication

The Year Book of the Eye Ear Nose and Throat is recommended for all practicing ophthalmologists and otolaryngologists but is considered too specialized for the undergraduate student and the general practitioner —*Lt Col F L Spann MC USA*

Cor l t v N ur anat my and Funct on l N urol gy by *Joseph J* M D ld M S M Sc D M D Profe or of Surg y C l mbi Un t ty Att d g Surg P byt n Ho pit l N w Y k D ctor of the S g l Serv c F c D l f ld H p t l N w York nd *Jo eph G Chu d* A B M D Att d ng N ur *log st St V c nt s* Hl sp l N w Y k. 6th d t 263 p g llu trat d L g M d c l P bl c ti U ity M d l P bli h rs L Altos C lif 1952 P c $4

This manual which has served a useful purpose for several years has been revised and enlarged It should be welcomed by medical students and others who desire in outline form, a survey of neuroanatomy About 83 pages have been added, including notes on embryology headache syncope, muscle testing muscle innervation and the myopathies A chart outlining the physical demands of daily life is a welcome addition Most of the diagrams have been redrawn and enlarged and add to the clarity of the presentation The pictures of pathologic processes are, however inferior and might better be left out The references for the most part have not been brought up to date

—*Lt Comdr R G Berry MC USN*

Rheumatic Diseases Diagnosis and Treatment by Eugene F Traut M D Associate Clinical Professor of Medicine (Rush) University of Illinois Attending Physician to the Cook County Hospital and the West Suburban Hospital Oak Park Illinois Associate Attending Physician to the Presbyterian Hospital of Chicago Director of the Arthritis Clinic of Cook County Hospital Lecturer on Arthritis in the Cook County Graduate School of Medicine Member of the American Rheumatism Association 942 pages 192 illustrations C V Mosby Co St Louis Mo publishers 1952

Although written primarily for the rheumatologist this book contains a wealth of material which the internist or general practitioner will find interesting and instructive The material is presented in an orderly and logical sequence beginning with the cause, classification and pathogenesis of diseases of the joints and progressing to various aspects of treatment This arrangement avoids much repetition in discussion of the many entities described that are as closely related and similar in symptomatology, pathogenesis, and treatment as are the rheumatic diseases It also affords the reader authoritative reference material in readable form The chapters on rheumatic fever focal infections, and the relation of the endocrine glands to rheumatic diseases are especially good In the latter the author clearly describes the role of the adrenal steroids in the management of these disorders, bringing into sharp focus the indications and contraindications for the use of these relatively new therapeutic aids He also discusses the role of the other endocrine glands in the pathogenesis and treatment of rheumatic diseases With such a large segment of the population of this country affected directly or indirectly by rheumatic diseases and so little time devoted to the study and care of these chronic illnesses in medical school and general hospitals most physicians should find this book a valuable addition to their libraries

—*Comdr W W Driskell MC USN*

Inflammations Neoplasms by Sidney Licht M D Associate Physician Beth Israel Hospital New York N Y Modern Medical Monographs XX 165 pages Grune & Stratton Inc New York N Y published 1951 $4 50

This monograph is very readable and as Dr Houch pointed out in the foreword "this book will be of great value to those physicians who deal with adolescent and young adult population and will aid in giving efficient medical care within the educational institution and in the military services" The 25 case protocols grouped in chapter 7 provide an interesting feature His review of the case reports obtained from the literature is excellent On occasions the author labors over his statistics and offers conclusions which do not appear to be based on a significant series of cases as for example the seasonal incidence of the disease as noted in chapter 2 —*Lt Col C S Christianson, MC USA*

Treatment of Mental Disorder by *Leo Alexander* M D Director Neurobiological Unit Division of Psychiatric Research Boston State Hospital and Instructor in Psychiatry Tufts Medical School 507 pages illustrated W B Saunders Co Philadelphia Pa publishers 1953

The author's purpose in this book is "to demonstrate as specifically as possible how psychic and physical aids to psychiatric treatment must be used as one instrument of therapy" From the historical viewpoint, this is an attempt to bring together the 2 extremes of the therapeutic spectrum, namely Griesinger's contention that mental diseases are diseases of the brain and Sullivan's belief that psychiatry is the field of human interpersonal relationships Dr Alexander begins with a review of some of the schools of modern psychiatric thinking and includes cultural and diagnostic considerations Chapters on the general principles of psychotherapy and such means of somatic therapy as electric shock, insulin, and psychosurgery follow The author then considers the modes of actions and complications of these therapies Practical aspects of both types of treatment are then discussed Brief chapters on alcoholism, states of intoxication, and organic syndromes complete the book

The author is an advocate of nonconvulsive electric therapy either alone or in combination with the convulsive type He demonstrates, out of his own experiences, the integration of both psychotherapy and somatic therapy in the clinical management of the patient He shows, with numerous case histories, how electric shock therapy may be used as an adjunctive procedure in the total management of the mentally ill patient He emphasizes the responses of the autonomic nervous system (as measured by the Funkenstein test) as indicators for the use of electric convulsive therapy In a sense, this book gives a broad practical view of the therapeutic armamentarium now available to psychiatrists I enjoyed the author's easy and lucid style Dr Alexander has a flair for making psychiatric case reports fascinating The fact that he approaches his work with optimism is in itself a noteworthy contribution to the psychiatric literature —*Comdr M Shoor MC USN*

Physiologic Therapy for Obstructive Vascular Disease by *Isaac Starr* M D Harrzell Research Professor of Therapeutics School of Medicine University of Pennsylvania Philadelphia Pa Modern Medical Monographs No. 6 38 pages illustrated Grune & Stratton Inc New York N Y publishers 1953 Price $2 50

The material in this small monograph was originally presented as the George E Brown Memorial Lecture at the scientific session of the American Heart Association in Cleveland, Ohio, in 1952 It is largely a historical review of our progress in treatment of peripheral vascular disease It is particularly cerned with the personal experiences of the author Although

contains little that is new, it can be easily read with great pleasure Bibliographic references are included

—Col E M Goyette MC USA

The 1952 Year Book of Urology (November 1951-October 1952) edited by *William Wallace Scott* M D Ph D Director James Buchanan Brady Urological Institute The Johns Hopkins Hospital Urologist-in-Charge The Johns Hopkins Hospital Professor of Urology The Johns Hopkins University School of Medicine 371 pages illustrated The Year Book Publishers Inc Chicago Ill 1953 Price $5 75

This yearbook abstracts 307 articles and presents the current approach to common urologic problems It is the best compilation of up to-date articles in this field available today The table of contents is arranged to facilitate easy reference, but most of the articles lack bibliographies and good illustrations The article on the endocrine management of disseminated prostatic cancer deserves special attention There is an excellent subject index and an index of authors *—Lt Col R A Lawn USAF (MC)*

How to Improve Your Sight Simple Daily Drill Relaxation by *Margaret D Corbett* (Authorized Instructor of the Bates Method) Revised edition 93 pages illustrated Crown Publishers Inc New York N Y published 1953 Price $1 50

This book clearly enunciates the claims made by proponents of the so-called Bates method of scientific relaxation of the eyes " which is reported to improve the visual acuity and even eliminate organic pathology, such as cataract in many instances According to the author, this method of treatment fails only when discontinued too early This probably occurs in many instances, either when the victim s money is gone or as a result of seeking wiser counsel The basic concepts of ocular function as given in this book are in general not in agreement with accepted concepts of ophthalmic physiology and in several instances can be readily disproved For example the claim made in this book that the extraocular muscles control the focusing of the eyes and that the lens plays little if any part in this function is obviously erroneous Because patients occasionally inquire concerning the Bates system which they hope will enable them to discard their spectacles the book may be considered of interest to those who wish to be better prepared to educate the public concerning charlatan practices

—Comdr J B Smith Jr MC USN

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FOREWORD

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Monthly Message

During a recent visit to overseas medical installations I heard certain criticism of the necessity for standardization of therapy in military medicine We all recognize that standardization in the application of therapeutic principles is distasteful to most of the medical profession Nevertheless there are conditions under which our mortality and morbidity rates may be markedly improved by the application of standard medical procedures

In the care of combat casualties or those occurring in a civilian catastrophe a large number of health personnel with a variety of professional competence are required for the treatment of the injured Therapy initiated at a forward echelon of medical installations is continued along the chain of evacuation with a series of professional men and women each contributing to the eventual recovery of the patient This situation precludes an infinite latitude in individual therapeutic choice lest the first treatment narrows the limits of ultimate definitive care to the detriment of the patient.

For example different methods of treating burns are advocated by competent medical authorities which under controlled environmental situations may yield equally satisfactory results but under the modifying influences of mass casualties and distant evacuation do not all present solutions of equal merit Though an individual medical officer may be desirous of using a particular therapeutic measure he must learn to conform to the standards established lest the initial treatment set the course of future definitive care in a pattern unfamiliar to the personnel and unadaptable to the facilities available in the chain of evacuation

Despite the stringent conditions imposed by combat our military health personnel have a broad choice in the various types of treatment they may employ This is reflected in the highly competent manner in which the officers of our medical services are rehabilitating the sick and wounded patients under their care The standardization of therapeutic procedures in the military services to the degree necessary should not limit or handicap any medical officer in the performance of his professional duties

Melvin A Casberg M D
Assistant to the Secretary of Defense
(Health and Medical)

INTERMEDIATE TREATMENT OF MAXILLOFACIAL INJURIES

JAMES E CHIPPS *Lieutenant Colonel DC USA (1)*
ROBERT G CANHAM *Captain MC USA (2)*
HARRY P MAKEL *Major MC USA (2)*

THE development of modern methods of air evacuation of casualties and the localized nature of the Korean campaign have placed the larger Army hospitals in Japan in a unique position Although these hospitals compare with the fixed hospitals in the zone of the interior in facilities, specialization of staffs, and safe distance from the combat zone, most United Nations casualties are received within a few days after injury Open wounds are observed before the granulation stage and fractures are observed while the fragments are still mobile These factors have permitted the development of intermediate treatment of trauma on a scale not heretofore possible Service in the largest of these hospitals from August 1950 to February 1953 provided an opportunity for observing and treating a large number of maxillofacial injuries, including 1,000 osseous fractures Certain observations made and concepts acquired during this period are of general interest

The necessity for intermediate treatment of the individual patient depends on the nature and degree of the primary treatment previously rendered Early in the campaign, during the period of the Pusan bridgehead and the months of rapid advance followed by rapid withdrawal, the medical facilities in Korea were primarily concerned with necessary lifesaving measures and with rendering the patients transportable to Japan rather than with definitive treatment In later months, oral surgeons were placed in most mobile surgical and evacuation hospitals in Korea In patients with maxillofacial injuries this greatly curtailed the need for primary treatment in Japan If wounds were properly debrided and closed and fractures reduced in the first 24 hours, the final result esthetically functionally, and psychologically far exceeded any result possible when treatment was delayed Every effort should be made to continue increasing the facilities for early definitive treatment in the field but when circumstances prevent adequate primary treatment

(1) [illegible] U S Army Far East Command [illegible] Army Forces Far East and [illegible]
(2) [illegible] Army Hospital [illegible]

a well planned intermediate program will produce better results than would be obtainable by further delay of definitive treatment until the patient finally reaches the zone of the interior

WOUND MANAGEMENT

Primary closure

Most authorities prefer conservative debridement of contaminated facial wounds followed by immediate closure to a more radical excision of suspected tissue followed by immobilization of the open wound which was advisable prior to the advent of modern chemotherapy When properly repaired in the first 24 hours and supported by adequate chemotherapy the maxillofacial



Figure 1 R lt 10 day after arly l ur of ere wo d of ma d bl ad t g

wound usually heals promptly with minimal scarring Early closure of a severe facial wound greatly improves the patient s morale If treatment is delayed the average patient is depressed by the appearance of his facial wound and must undergo painful dressing changes debridement and unnatural methods of feeding

A striking example of the successful primary closure of a severe wound is shown in figure 1 This patient sustained a severe 8- by 13-cm stellate wound of his right cheek with a similar wound of exit in the left submaxillary area There was a primary avulsion of the entire body of the mandible and an avulsion of the entire tongue The hyoid bone was partially avulsed as were most of the suprahyoid structures Within 6 hours of being wounded he received a tracheotomy a supportive gastrostomy debridement and repair of the facial wound in a mobile surgical hospital near the front He arrived in Japan 6 days later in excellent condition His morale was exceptionally high as compared with other patients received at the same time with

lesser but untreated wounds By the fourteenth day, his external wounds had healed with minimal scarring

Although the advantages of an early closure are undeniable, about 30 percent of wounds involving the mouth which had been primarily repaired were seen to break down in whole or in part The causes of such breakdowns were

1 *Tight closure of wounds without provision for deep tissue drainage* The accumulating fluids materially add to the tension on the wound edges, causing necrosis and breakdown



Fig e 2 Breakdown of a wound initially completely closed following acute secondary hemorrhage from the external maxillary artery

2 *Inadequate use of bandage* Besides immobilization of the wound, a properly applied bandage minimizes the accumulation of edematous fluids which add to tension on the wound edges

3 *Failure to treat the oral surface of a wound* The deep tissue and skin of many wounds were properly sutured but the oral mucosa had been left friable and unsutured, permitting intrusion of oral fluids, tongue movements into the open wound, and accumulation of fermenting food debris

4 *Secondary hemorrhage* In 4 patients, breakdown of repairs was attributed either to profuse secondary hemorrhage from unligated major blood vessels or as a result of surgical intervention to control hemorrhage Figure 2 illustrates the breakdown of a wound, initially completely closed, after acute secondary hemorrhage from the external maxillary artery at a point just mesial to the mandibular angle The pulsating stump of the vessel was located in an area seemingly free of gross infection This hemorrhage was probably due to primary injury to the blood

vessel rather than to secondary infectious erosion The original control of the hemorrhage may have resulted from primary blood loss coupled with proximal suturing during wound repair rather than control by ligation of the bleeding vessel If so, such a breakdown could have been prevented by a thorough examination of the wound for vascular injury

5 *Secondary manipulation of the repaired wound* Though not a direct result of primary repair a frequent cause of breakdown was secondary manipulation usually for reduction of a fracture Most fractured mandibles associated with infected wounds remained sufficiently mobile for 10 days after injury to permit the use of simple methods of closed reduction After that period reduction methods were necessarily more complex Thus if a soft tissue wound had been repaired without provisions for fracture reduction and if the wound had not sufficiently healed within 10 days a secondary operation to reduce the fracture frequently precipitated a breakdown of the wound repair This *could be prevented by adequate reduction and immobilization at* the time of primary wound repair Such procedures need not be complex If a fracture is generally aligned and moderately immobilized the receiving surgeon can afford to await wound healing before constructing a definitive fracture fixation gear

6 *Inadequate chemotherapy* Though some degree of infection was expected in contaminated wounds it was often found following wound breakdowns through culture and sensitivity studies that the contaminating micro-organisms were resistant to the antibiotic drug being used

Hence the early closure of a contaminated maxillofacial wound is not contraindicated but the success of such a closure is directly proportional to the attention paid to standard surgical principles of debridement hemorrhage control proper suturing maintenance of drainage adequate use of bandages and giving adequate chemotherapy

Delayed primary and secondary closure

Military conditions do not permit definitive repair of every wounded soldier within 24 hours The number of patients who arrived in Japan without such treatment was not significant after the early months of the war Though evacuation methods were generally excellent none of these patients was received in Japan in the first few hours after being wounded Thus infection induration and necrosis precluded immediate wound closure The intermediate hospitals were therefore faced with the problem of management of open wounds

Early primary closure holds infection to a minimum by closing the avenues of contamination results in minimal scarring and

Figure 3 Picture taken 3 days after wounding showing gangrene and necrosis loss of tissue and avulsion of anterior portion of mandible Figure 4 Same patient 6 days later Note splint on mandibular stumps

contracture improves morale, reduces the need for nursing care and bandaging and permits early return to a satisfactory method of feeding To a lesser degree the same advantages follow de layed primary and secondary closures performed at the first opportunity It was therefore decided that whenever possible maxillofacial wounds would be closed without delay even though many such patients would require months of reconstructive plas tic surgery in the zone of the interior

No complex closure methods such as pedicle flaps were attempted Closure by direct approximation of wound edge skin graft or suture of mucosa to skin acro s a defect generally ac complished the desired result at the intermediate stage Illus trative types of such closures follow

1 *Direct closure* A wound in which much tissue has been avulsed or débrided if directly closed, will show di tortion of the remaining ti sue About the mouth this can often be mini mized by the u e of supporting splints which are al o useful in fracture management

Figure 3 shows a patient as received in Japan 3 days after a wound of the chin Thirty five percent of the lower lip much chin tissue and the anterior portion of the mandible from the left canine to the right premolar area had been primarily avulsed Necrosis and gas gangrene were present As soon as possible the wound was débrided and impressions for splint construction were obtained Six days after admission the wound being es en tially cleared of gross infection and induration the patient was anesthetized and an acrylic splint inserted and wired to the mandibular tumps (fig 4) The wound edges were then approxi mated and closed in layers Intermaxillary elastics between the splint and the maxillary teeth immobilized the mandible and partially immobilized the wound during the healing period The splint althou h ad lin somewhat to the tension under which the wound was closed prevented undue distortion of the oft ti sues Fourteen days after admission the sutures had been removed and the patient was ready for further evacuation (fig)

A more striking example of successful delayed closure with the use of a supporting splint to prevent undue distortion is shown in figure 6 The patient sustained an avulsion of the man dible from the right canine to the left mandibular ramus There was a 50 percent loss of the lower lip loss of much chin and left cheek tissue and destruction of the left floor of the mouth A large cup-shaped splint extending under the tongue for sup port and contoured to replace the left cheek was con tructed wired to the teeth of the right mandibular stump keyed into position and wired to the teeth of the left maxilla thus immobi

lizing the stump in normal position A groove in the posterior surface of the splint rested over the anterior margin of the left mandibular ramus and prevented displacement of that fragment The wound was then closed under tension over the splint (fig 7)

2 *Skin graft closure* Frequently the primary loss of skin and superficial tissue exceeded the loss of deep tissue and oral mucosa In such patients, a skin graft dressing was used to provide the advantages of early wound closure Such a patient



Figure 5 Same patient (shown in figures 3 and 4) 14 days after admission.

was received after sustaining a wound which involved extensive loss of skin and superficial tissue, but minor loss of deep tissue and minor penetrations into the mouth (fig 8) In such a patient a skin graft will provide the benefits of early closure while he awaits reconstructive surgery As in the case of direct closure, the first step consisted of wound debridement and treatment of the mandibular fracture In most such wounds, if débridement is adequate and no undue tension is created, the oral penetrations may be immediately closed even in the presence of infection Thus, in this patient, at the first operation the oral mucosal penetration were freshened slightly undermined, and lightly closed The wound could then be treated as a one surface superficial wound while being readied for skin graft. The graft was applied on the seventh day after admission The result, 15 days after admission, is shown in figure 9

3 *Closure by suture of skin to mucosa* When much tissue has been avulsed many of the benefits of wound closure can be obtained in the weeks preceding reconstructive surgery, by suturing the skin to the mucosa across the defect Figure 10 shows

Figu e 6 P ti t d i J p n. Figur 7 S m p ll t 16 days fi dmi t n.

Figure 8 Patient as received in Japan Figure 9 Same patient Note successful early skin graft

a patient with loss of more than 50 percent of his lower lip Direct closure would have necessitated an extensive V shaped excision of chin tissue On the other hand this wound was not ready for plastic closure by a sliding flap After debridement the small cheek wound was directly closed and the defect in the lower lip closed by undermining mucosal and skin layers and joining them across the defect After healing the patient no longer required nursing care nor presented a feeding problem and he was evacuated to the zone of the interior for reconstruction



Fig 10 P ti t a ived.

This method can be used in extensive wounds when little else can be immediately accomplished in definitive treatment Figure 11 shows a severe maxillofacial wound The eyes nose, upper lip and anterior portion of the mandible were avulsed The cheeks were destroyed and the maxilla shattered The patient though neurologically in good condition was essentially without means of communication No closure was possible without prolonged and multiple plastic procedures which could not be accomplished in an overseas theater A lower splint was constructed and wired to the mandibular stumps reducing the fragments to normal position An upper splint immobilized the multiple maxillary fragments into one unit and mechanically closed a large perforation of the palate The mucosa about the remnants



Figure 11 Patient as received. Figure 12 Same patient with acrylic splints

of the lips and cheeks was sutured to the skin providing closure of the lower part of the wound (fig 12) Then, with debridement and packing of the maxillary and frontal sinuses and insertion of plastic tubes into the nasal passages to prevent adhesions the middle portion of the face was closed by an elastic bandage If carefully applied the bandage prevented escape of air except through the mouth and could be used as a makeshift upper lip thus restoring speech to the patient The splints provided moderate immobilization of the fractures and partial feeding by mouth was allowed With these outside contacts restored the patient s morale was greatly improved

TREATMENT PROGRAM

Thus, a program for the definitive management of open maxillofacial wounds in an intermediate general hospital was established The major considerations in such a program are

Examination and planning the treatment

In order to formulate plans for treating the fracture and closing the wound the nature of the wound any associated fracture and the patient s general condition had to be considered Other important considerations during this phase included the evaluation of the necessity for joint procedures by various other specialty services and for special supportive measures such as tracheotomy transfusions and gastrotomy

First operation

Primarily designed for wound débridement and fracture stabilization the first operation was of immediate benefit and was rarely contraindicated by the patient s general condition It could usually be performed as soon as the examination was completed and the surgical schedule permitted

Preclosure period

Prior to the advent of modern chemotherapy the preclosure period was so prolonged as to preclude definitive treatment of transportable patients in intermediate hospitals and as much as any other factor influenced the establishment of specialized treatment centers far from the combat zone In 1950 it was not unusual to hear older surgeons objecting strongly to programs for early closure of contaminated wounds stating that such closures could not succeed The advantages of an early closure are great and if strict attention is given to certain details the period necessary for preparing an infected maxillofacial wound for closure would rarely need to exceed 5 to 7 days Besides the maintenance of adequate drainage the more important details are

1 *Adequate use of an effective antibiotic* Because of the early and liberal use of antibiotics in Korea (usually penicillin and streptomycin), localized rather than generalized infection was the problem in the patients with maxillofacial injuries observed in Japan Only one patient with severe septicemia was encountered If, however, the wound remained open, the organisms present in the wound a few days later were rarely found to be sensitive to the antibiotic initially given Frequent culture and sensitivity tests were required and a change in antibiotic was often indicated

2 *Continuous wet dressings* were applied locally 24 hours a day Multiple tests in which some wounds of a patient were treated by wet and others treated by dry dressings proved the efficacy of wet dressings in preparing the wound for closure Various solutions were used—particularly solutions of salt acetic acid terramycin, and bacitracin Those containing antibiotics were slightly more beneficial Heat in combination with the wet dressings was found to be beneficial after multiple comparative tests

3 *Redebridement* Because conservative debridement is essential in maxillofacial surgery only the frankly necrotic tissue was removed in the first operation Thus, in the preclosure period, the wounds were examined daily for further devitalization Necrotic areas, if present, were locally removed with tissue forceps

4 *Removal of contaminating and fermenting food debris from the wound* If the oral involvement was of any import, oral feedings were not allowed The Levine tube was usually employed An early gastrostomy was recommended for severely wounded patients

Closure

Final fracture fixation was completed prior to closure The degree of success in the closure depended on the attention paid to standard principles of surgery

Postclosure period

Re-evaluation of the antibiotic program and attention to the bandage were important in this period It was generally found that the wound had sufficiently healed to obviate the necessity for daily supervision within 8 days, and the patient could then be scheduled for further evacuation if indicated Thus with a preclosure period of about 6 days and a postclosure period of about 8 most patients need not spend more than 2 weeks in an intermediate center

Supportive and other measures required

1 *Adequate chemotherapy* is important

2 *Tracheotomy* has been liberally employed in the Korean campaign 119 tracheotomies having been performed in patients with maxillofacial injuries Of these 113 had been performed in Korea and 6 were necessary after arrival of the patients in Japan Many other tracheotomies were observed in patients not under control of the oral surgery section Of the various measures used this was the subject of the most controversy in correspondence with observers in the zone of the interior Because of the usefulness of the accessory airway in anesthesia and maxillofacial repair some thought that if the tracheotomy had been performed overseas the tube should be retained until the patient had finally reached a treatment center in the zone of the interior where the receiving surgeon could choose between removal or further use Others thought that laryngeal reactions sufficiently frequent to justify the removal of the appliance overseas as soon as it was no longer essential to the primary treatment At least one qualified observer stated that far too many tracheotomies were being performed in patients with fractured jaws

In Korea much of the evacuation of casualties from advanced points to evacuation hospitals has been by helicopter Although the advantages of this rapid means of transportation over difficult terrain is well known a disadvantage for a patient with a maxillofacial injury is that he is unattended during a critical stage of a wound involving the airway Accordingly we believe that the liberal use of tracheotomy as a prophylactic measure under these conditions is justified As far as could be ascertained no death has been attributed to this procedure and no death in air evacuation from Korea has been attributed to asphyxiation—an amazing record and one in which prophylactic tracheotomy has been an important factor

In the 119 patients observed in Japan only 2 complications of import were noted An empyema which was thought to be the result of aspiration of blood and secretions attributable to the tracheotomy developed in 1 patient but his tracheotomy was an essential requirement rather than a prophylactic measure In a second patient a pneumothorax was thought to be due to pleural puncture at the time of tracheotomy Both patients recovered Some patients arrived in Japan with moderate embarrassment of respiration due to accumulated secretions plugging or partially plugging the tracheotomy tube A mechanical suction apparatus should be available on every evacuation aircraft Increased emphasis during the training of evacuation personnel should be placed on the postoperative care of patients with tracheotomies

The presence of a tracheotomy tube saved the life of at least 2 patients with profuse parapharyngeal hemorrhage in Japan by permitting presurgical control of the hemorrhage through direct pressure In many other patients tracheotomies have permitted procedures in anesthesia, definitive surgery, and use of an adequate supporting bandage which would otherwise have been impossible

As regards the retention of the tube after completion of intermediate treatment, the patients were referred to the ear, nose, and throat section and treated on an individual basis If there was no laryngeal reaction and the patient seemed well adjusted to the appliance and capable of providing his own care, it was retained during further evacuation If there was evidence of chronic laryngitis or if no early operation in the zone of the interior seemed indicated, the appliance was removed

3 *Secondary hemorrhage* due to extension of necrosis as a result of infection, or to secondary trauma from metallic or bony spicules induced by manipulation, coughing, swallowing, and the like, was a major problem in 11 patients with maxillofacial injury Nine of these occurred in the early months of the campaign prior to the establishment of the system of advanced mobile surgical hospitals, and such hemorrhages were probably due to lack of adequate ligation of vessels and debridement of wounds at the primary stage, but in many penetrating wounds involving the pharynx adequate surgical access for wound management is technically impossible, and frequently such wounds must heal by secondary granulation

Because of the 11 hemorrhages, 7 occurred on the twelfth day following injury and all occurred between the ninth and fourteenth days, it became customary in the second week after injury (1) to watch patients with infected wounds near major blood vessels for signs of hemorrhage, (2) to keep equipment for the control of hemorrhage available at the bedside, (3) to retain the tracheotomy appliances, if present, and (4) to postpone evacuation to the zone of the interior during the apparently critical period

Sometimes in extensive open submandibular wounds, it was noted that sloughing of devitalized tissue had resulted in the wide exposure of major vascular trunks in the base of the wounds As a prophylactic measure in the early months, such exposed vessels were ligated if the point of exposure was above the carotid bifurcation, but, if such exposure involved the bifurcation or the common carotid artery so as to preclude ligation, such conservative measures as careful debridement, attention to dressings, immobilization of the wound until secondary closure was possible, and prescribing antibiotics locally and systemically

were used After a series of such wounds it was noted that no exposed arterial trunk if initially intact had secondarily rup tured Because the conservation of blood especially in patients with fragmentation of bone was essential to proper wound man agement it was thought that if major exposed arteries could be successfully treated without ligation minor vessels could be similarly treated The prophylactic program was therefore altered and all intact arteries in exposed wounds were treated without ligation No secondary rupture occurred in such vessels

4 *Nutrition* The maintenance of nutritional balance in a pa tient undergoing prolonged maxillofacial treatment required a rigidly supervised program Because the stay of most patients in an advanced or intermediate hospital was too brief for gross changes from impaired nutrition to become evident, the tendency in the early months of the campaign was to rely on intravenous feedings to provide the necessary fluids during early treatment and to allow a liquid or soft diet as soon as possible This pro- gram was later found to be inadequate and perhaps was account able for unexplained delays in healing and for the nonunion of fractures

As in most general hospitals the dietary service formulated 3 special diets for patients with fractured jaws These diets were adequate in protein, caloric vitamin and mineral content *provided* the entire diet could be assimilated The diets were prescribed by number Number 1 being essentially a liquid diet for patients with recent fracture and intermaxillary ligation Number 2" being slightly heavier, and Number 3" being essen tially a soft diet for patients who were permitted mandibular function

Severely wounded patients or those undergoing definitive oral surgery however could not assimilate these diets when taken by mouth It was considered important in wound management to eliminate the oral intake of food during the preclosure and early postoperative stage In such patients a supervised program of tube feeding was maintained Levine tubes were inserted shortly after admission and retained during the definitive treatment stage These tube feedings were adequate in nutritive essen tials In most patients the tubes could be removed and appro- priate diets by mouth substituted within2 weeks

There was a marked clinical difference between patients so treated and those allowed oral feedings as tolerated supple mented by intravenous fluids Physically the tube fed patients appeared stronger and showed less weight loss Locally their oral wounds were readied for closure earlier and the postopera tive healing periods were shorter possibly explained on a local basis of less salivation better wound immobilization absence

of fermenting food debris in the wound, and better retention of bandages A secondary advantage attained by the use of tubes was the ease of administrating drugs ordinarily given by capsule—a difficult procedure in the nontube fed patient undergoing treatment for a fractured jaw

There were, however, disadvantages in the use of tubes Some complaints were on a psychologic basis which could be minimized by careful explanation of the need for tubes and by allowing ice chips and completely soluble foods, such as cubed sugar, orally Ulcerations of the posterior pharyngeal wall developed occasionally, particularly if the period of tube feeding exceeded 2 weeks Plastic tubes were found to be less irritating than rubber

Maxillofacial wounds with much tissue loss required multiple and prolonged restorative procedures For such patients, a gastrostomy is the method of choice for food administration If it is to be used, it should be used early before nutritional imbalance has occurred It was used in 15 of our patients in Japan, with apparent benefit to each Four other patients arrived from Korea with gastrostomy tubes in place The marked benefit derived from such early treatment for the patient illustrated in figure 1 has been noted, but in another patient, the bulb of the tube had collapsed and the tube slipped from the stomach during evacuation This had been followed by a feeding into the peritoneal cavity with subsequent severe reaction Thus, in spite of the advantages of early gastrostomy, the procedure should not be used at advanced hospitals if the patient cannot be retained for the 4 or 5 days necessary for a tissue tract to form between stomach and abdominal wall

5 *Anesthesia* Fortunately no untoward anesthetic mishap was observed in the procedures in this series The nature of maxillofacial treatment during the operation and during recovery is such that unusual problems of airway maintenance must be considered The operation itself involves the airway and presents mechanical problems along with problems of the accumulation of blood, pus, foreign bodies, and other debris The electric cautery, if used, is applied in the same field in which the anesthetic agent is usually administered A smooth, rapid induction of anesthesia and a postanesthetic period free of nausea and vomiting with its attendant danger of aspiration is more important than usual, especially in patients who require intermaxillary ligation during the recovery period

For these reasons, endotracheal intubation is essential and thiopental sodium intravenously in conjunction with the endotracheal administration of nitrous oxide and oxygen has proved to be an excellent anesthetic agent

The intubation should be preceded by topical anesthetization of the larynx in order to minimize the danger of laryngospasm as well as to permit the blind nasal intubation of the patient without the attendant distortion of fragmented bone or damage to complex fracture reduction gear by the use of a laryngoscope The transtracheal injection of 4 percent cocaine was the method used and in a series of 231 maxillofacial patients as well as 1 410 other patients no toxic reactions to cocaine were observed Probably this was because the entire topical dosage of the drug consisted of but 80 mg (2 cc of a 4 percent solution) and most of this was coughed away and expectorated

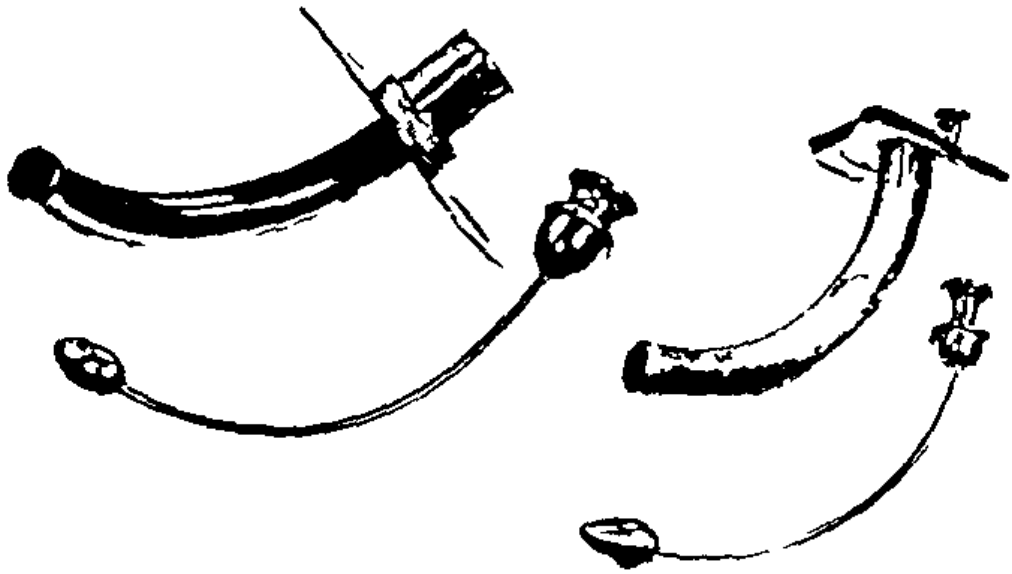


Figure 13 On the right is a standard Magill tracheal tube and on the left the corresponding appliance constructed at Walter Reed Army Hospital for use with the laryngoscope

Prior to operation the anesthesiologist examined the patient himself to visualize the problems of anesthesia and mechanics of surgery Premedication consisted of 100 mg of pentobarbital 2 hours prior to induction followed in 1 hour by a demerol atropine combination (100 mg and 0 6 mg respectively) At operation, just prior to the transfer of the patient from the litter to the operating table the cocaine solution was injected through the cricothyroid membrane In from 5 to 10 minutes, the larynx and upper trachea became anesthetized Slow induction with a 2 5 per cent solution of thiopental sodium was then begun with from 2 to 4 cc being injected at intervals of from 15 to 20 seconds fol

lowed by intubation as soon as the patient was asleep Because such an induction does not depress respiration, the breath sounds serve as a guide in the blind nasal intubation The anesthesia was then sustained on a 75 25 percent mixture of nitrous oxide and oxygen supplemented by small doses of thiopental as required

During the operation, the pharynx was closed from the mouth by a wet gauze pack around the tube The trachea was kept free

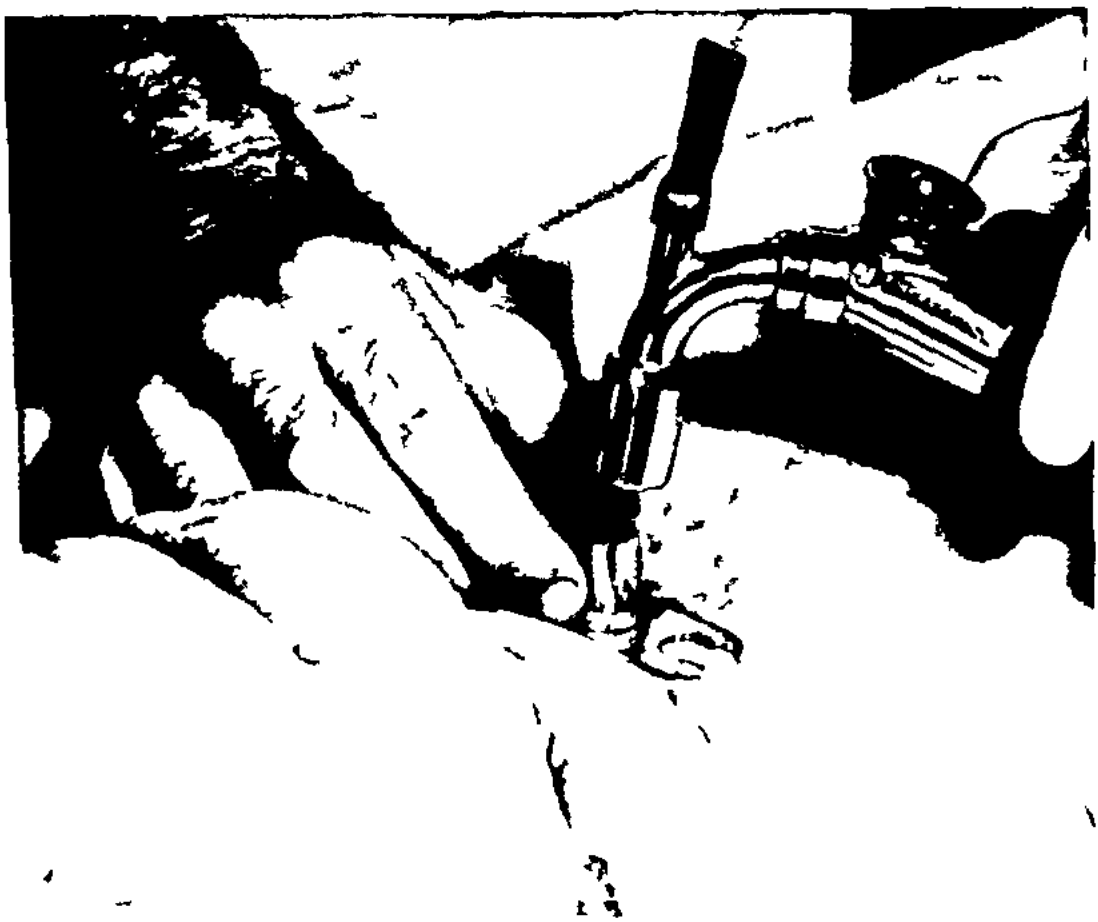


Figure 14 The tracheotomy tube modified for gas anesthesia in use The connector is fitted with a rubber tip closing an accessory outlet for endotracheal suction.

of secretions by suction through an accessory outlet in the anesthesia apparatus Removal of the pharyngeal pack and further direct suction to remove all accumulated blood and debris followed the operation Frequently the jaws were then immobilized by intermaxillary ligation with elastics In the recovery ward the endotracheal tube was retained, accompanied by frequent suction, until the patient's protective laryngeal and pharyngeal reflexes were completely recovered The tube was then removed after careful examination for airway patency

Using such a technic no laryngospasms were observed and there were no mishaps of asphyxiation during or after the anesthesia Blind intubation was possible in 90 percent of the patients Except for a few patients with mild laryngitis no complications were noted Intermaxillary ligation gear should not be used during the stage of anesthesia unless a recovery ward is available

A modification of the above procedure was used in those patients with tracheotomies who thus required no laryngeal cocainization A great aid to anesthesia in such patients was the use of a modified tracheotomy tube designed to be attached directly to the anesthesia apparatus Such modified appliances were constructed in the usual sizes of tracheotomy tubes and during the procedure of anesthesia the original tube was removed and cleaned while the modified tube was substituted A No 6 tube with a corresponding modified appliance is shown in figure 13 Figure 14 shows the appliance in use

MAXILLOFACIAL FRACTURES

Conservative debridement There is apparently an unusual capability of maxillofacial tissue to survive severe injury either because of the rich blood supply derived from the multiple anastomoses of vascular beds or the relative immunity acquired through years of minor periodontal and paranasal infections When it became evident that a great many cases were to be observed an attempt was made to maintain statistical records on the survival of doubtful bone fragments The intermediate nature of the treatment program precluded a sufficient period of observation in most cases and the question what should and what should not constitute a doubtful fragment could not be accurately determined but dozens of fragments thought to have little chance for survival did show some degree of attachment and could be covered by suture of overlying soft tissue Of such fragments many more survived to be of use in fracture union than were lost by later sequestration In the few sequestrums observed none were thought to have been attended by any harmful sequela the fragments either working through overlying tissue or requiring minimal incision for removal and drainage

It was found that a satisfactory debridement of bone fragments could be attained by flushing the wound several times with a stream of normal saline solution under hand pressure from a bulb syringe If the fragments were flushed free it was thought that their removal had been indicated If the stream failed to dislodge them and they were of any use in fracture management their retention was justified Figure 15 shows a severely comminuted fracture in which the small fragments were retained and reduced (without material interference with the remaining blood supply)

by a wire suture passed around an acrylic splint and the fragments There was much speculation at the time as to the advisability of retention of the fragments The patient left Japan, but a follow up report from the zone of the interior indicated that he had been discharged to duty with bony union and without the need for a graft Treatment for 5 months in the receiving installation had been limited to reconstructive surgery for the accompanying soft tissue wound

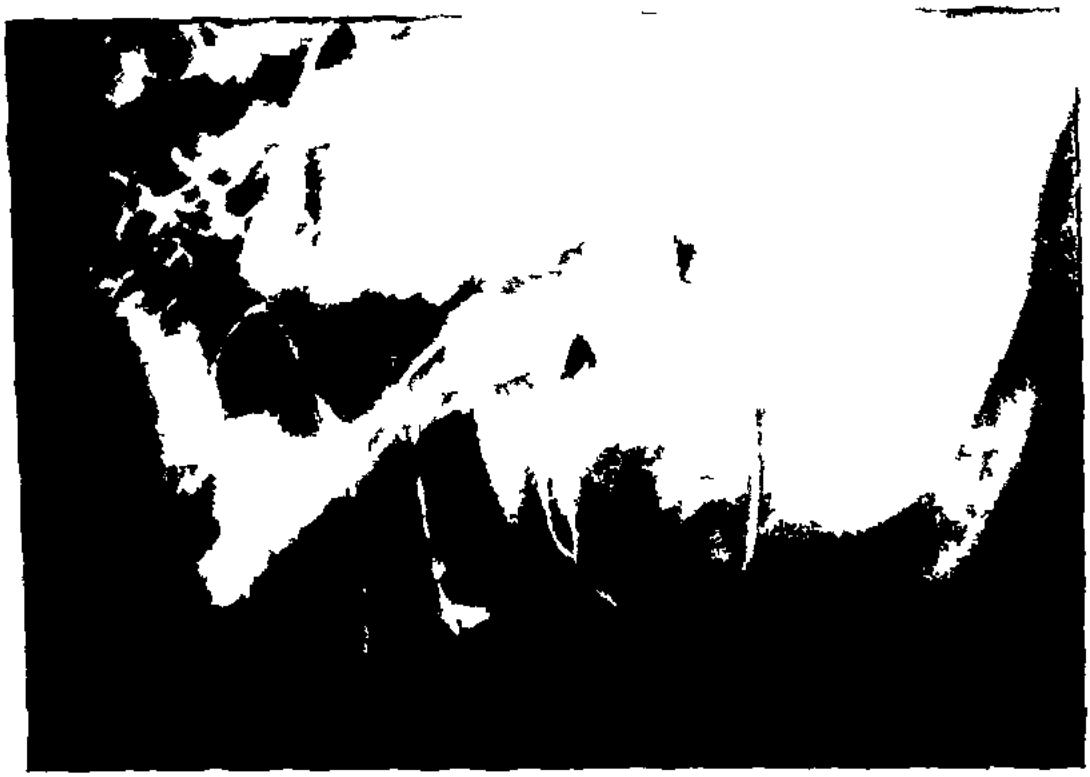
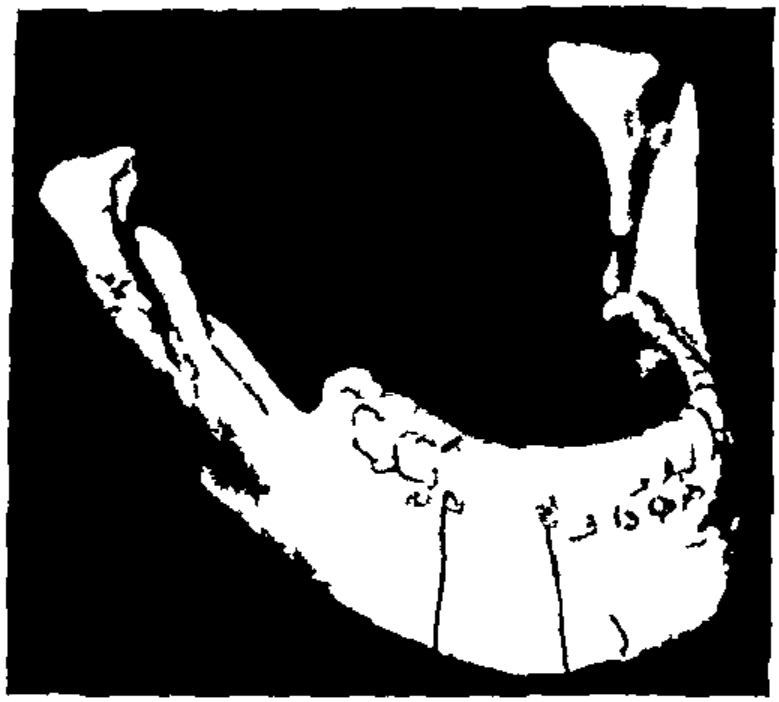


Figure 15 Severely comminuted fracture with retention of fragments and immobilization by splinting

Acrylic splints In the series of 1,000 fractures analyzed, most of the commonly described methods for reduction and immobilization were used Each method has its advantages and disadvantages, indications and contraindications All, except the use of splints, are adequately described in standard texts The acrylic splint is a versatile appliance and, in the primary or intermediate stage of treatment, is often the method of choice in a wide variety of fractures In the prolonged reconstructive stage of severe injury, where immobilization is of greater concern than reduction a precision cast, metallic splint is usually preferable to the acrylic appliance The acrylic splint can be constructed at most military dental facilities within 24 hours An important consideration in treating early injuries in the presence of swollen and distorted tissue is that the impressions necessary for obtaining a model of the dental arch need not be as precisely constructed as those for metallic appliances

The primary indications for the splint are fractures within the dental arch where comminutions loss of bone or multiple loss of teeth preclude satisfactory treatment by simple intermaxillary ligation but the splint can be used in combination with inter maxillary ligation or open reduction methods for fractures near the mandibular angle or distal to the dental arch When modified by the use of circumferential wires around splint and bone this technic obviates the necessity for open reduction for displaced fragments and because open reduction is not indicated for small fragments or in grossly infected fractures the splint is almost essential to the management of fractures due to missiles



Figur 16 Mod l f acryli plt t i d by co ti loop t d t l wi s

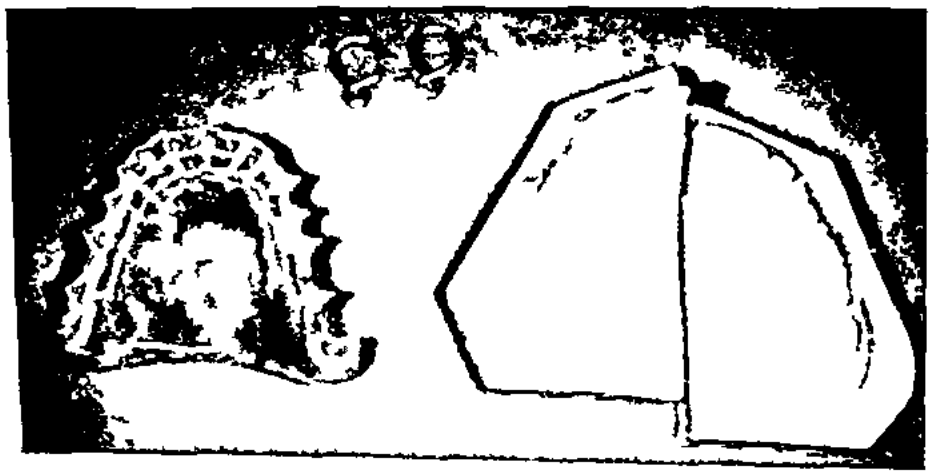
The type of acrylic splint usually described in publications and used for some years in military hospitals consisted of hinged buccal and lingual flanges gripping the dental arch and retained by a wire tightened around an anterior button It was inserted over displaced fragments with difficulty retention was not al ways adequate and immobilization was usually incomplete It was found that a splint constructed only against the lingual sur face of the arch and tightly retained by wires looped about the cervices of the remaining teeth and through holes prepared through the splint at the interproximal embrasures could be readily in serted It provided an excellent means of reduction of fragments merely by tightening the wire loops, and offered exceptionally good immobilization This method was developed in Japan by



Figu e 17 Avulsive fracture of mandible with stumps maintained in normal position by an acrylic splint.

the prosthodontist (3) after his earlier use of a similar appliance in World War II

Figure 16 shows a model with such a splint retained by continuous loop interdental wires Modifying circumferential wires provide reduction for an isolated fragment, and such wires are necessary for splint retention should there be too few remaining teeth Intermaxillary elastics can be applied if the fracture line is too near the mandibular angle for splinting of the rear fragment



Figu e 18 Splint for maxillary fracture

(3) L ut na t C l el Jame B N il DC USA

The splint provides an excellent means for bridging a gap resulting from bone avulsion and in such cases can be constructed to provide support for the closure of overlying soft tissue Figure 17 is a roentgenogram showing the retention of the splint and immobilization of the mandibular stumps

The splint is useful in treating comminuted fractures of the maxilla Figure 18 shows a palatal splint constructed to reduce 2 major maxillary fragments by wiring the splint to the teeth In such a case the splint might also act as a temporary obturator to close a defect in the palate After attaching wires to the splint bilaterally, passing them between the teeth and through the cheeks to end in fixation to small metallic rings nearly complete reduction of the entire maxilla can be obtained by elastic traction between the rings and a headcap Precise reduction can be obtained by the addition of intermaxillary elastics between the fractured maxilla and the mandibular arch provided the tendency for downward displacement of the maxilla by such intermaxillary elastics is offset by heavier traction upward to a headcap This technic therefore provides a means for immobilization of the mandible should it be concomitantly fractured with the maxilla

Partial analysis of 1 000 fractures In this series there were 662 fractures of the mandible 220 of the maxilla and 118 of the zygoma and zygomatic arch some being a combination of fractures in the same patient Zygomatic fractures treated entirely by other services were not included in this series The relatively high rate of maxillary and zygomatic fractures in comparison with the rate usually reported from nonmilitary installations is probably because penetration by a missile, as likely to occur in one part of the face as another was the primary cause of fracture

Of these fractures 679 were due to missile wounds 113 to vehicular accidents (ranging from bicycle to aircraft and including occupant and pedestrian) 98 to fights 44 to blunt instrument blows (including those with definite histories of kicks) 38 to trips and falls 13 to organized athletics 11 to blasts and explosions without missile penetration 2 to pathologic lesions and 2 to dental extraction Because some of the vehicular accidents, blunt instrument blows trips and falls were incurred in combat and some of the missile wounds were the result of accidental discharge self infliction, and assault it is estimated that 70 per cent of all the fractures were incurred in combat

Such variable factors as the degrees of infection comminution displacement the number of remaining teeth the nature of concomitant injury, and the time and facilities available for treatment enter into the choice of a method for the treatment of mandibular fractures but the single most important factor determin

ing the choice is the location of the fracture line or lines Thus, prediction of percents based on location would be of value in the training of personnel and the allotting of reduction materials Such studies have appeared in the literature from time to time with sufficient variations to indicate that the results of a great many such studies should be tabulated For such a purpose, fractures resulting from penetrating missiles are of no particular value because they are as likely to occur at one site as another,

TABLE 1 *Site of 237 mandibular fractures not caused by missiles*

Involvement	Location	Number	Percentage of total (to two decimals)
Single area	Condyle	34	14 37
	Ramus	4	1 68
	Angle	63	26 58
	Body	31	13 08
	Symphysis	25	10 54
Subtotal		157	66 24
Doubl area	Condyle bilaterally	3	1 27
	Condyle and ramus	1	42
	Condyle and angle	6	2 53
	Condyle and body	12	5 06
	Condyle and symphysis	6	2 53
	Ramus and body	4	1 69
	Angles bilaterally	6	2 53
	Angle and body	25	10 55
	Angle and symphysis	8	3 37
	Body bilaterally	3	1 27
	Body and symphysis	1	42
Subtotal		75	31 64
Multiple areas		5	2 11

but in this series there were 237 mandibular fractures attributed to other causes Considering the condyle to include the neck, the ramus to be the area between the condylar neck and the angle including the coronoid process, the angle to include the area of the third molar, the body to be the area between third molar and canine and the symphysis to be the anterior portion of the mandible between the canines, the site of the 237 fractures is shown in table 1

Fractures of the condyle and angle areas most frequently resulted from fist fights and fractures of the symphysis and body areas most frequently resulted from vehicular accidents About

70 percent of the fractures not caused by missiles were either completely removed from the dental arch or involved only the third molar area Because such fractures usually are amenable only to open reduction when materially displaced and usually require some form of intermaxillary ligation for immobilization the splint is of relatively minor value in comparison with its importance in the management of fractures caused by missiles The condylar process singly or in combination with other areas was involved in 67 cases (28 percent of the total)—an interesting finding in view of the number of articles that have appeared in recent years showing a wide divergence of opinion regarding methods for management of such fractures when materially displaced

CONCLUSION

Of a large number of patients with maxillofacial injuries, including 1 000 fractures observed in Tokyo Army Hospital Japan, some were evacuated no further than Japan and others had to remain in Japan for varying periods even though further evacuation was indicated Except for the prolonged reconstructive surgery required in treating severe injuries, most definitive treatment for maxillofacial injuries can and should be accomplished in the primary or intermediate stages and if a rigid program of pre and post-operative ward care is maintained such treatment can usually be accomplished within 2 weeks When maxillofacial injuries were adequately treated in the first 24 hours the results were notably better than those obtained after a delay in adequate definitive treatment

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BOOKS RECEIVED

The Wechsler-Bellevue Scale A Guide for Counselors by C. H. Patterson Veterans Administration Center Fort Snelling St Paul Minnesota Lecture Series Publication Number 148 American Lecture Series A Monograph in The Bannerstone Division of American Lectures in Psychology edited by Molly Harrower Ph D Research and Consulting Psychologist New York N Y 146 pages Charles C Thomas Publisher Springfield Ill 1953 Price $3 75

The Psychology and Psychotherapy of Otto Rank An Historical and Comparative Introduction by Fritz Kopf Ph D Author of American Social Psychology Its Origin Development and European Background 129 pages Illustrated Philosophical Library New York N Y publishers 1953 Price $3

THE CORNELL INDEX

A Comparison of a Matched Sample of Psychiatric Suspects" and Nonsuspects (1)

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THIS study undertakes to compare the Cornell Index for a group of 356 naval recruits examined during 1951, who were designated by various psychiatric examiners as psychiatric "suspects," *(4)* with a group of 356 recruits examined psychi atrically at the same time and *not* designated as "suspects " The samples were matched for age and education The distribu tion by age and education for the sample of suspects is given in table 1 The sampling of suspects is fairly good, but the sampling of the total population is necessarily poor because those with less education tend more often to be designated as suspects Thus the results for nonsuspects are of interest only as they are compared with those for the suspects

THE CORNELL INDEX SCORE AS A SCREENING DEVICE

The Manual for the Cornell Index affirms this instrument's value as a device for screening psychiatric rejects

> "If a cut-off score of 7 on the *Index* had been used, 86 percent of those rejected at the interview would have been rejected by the *Index* 28 percent of those accepted at the interview would also have been rejected by the *Index* " *(5)*

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(1) Th tudy wa mad t th U S Naval Tra ni g Stat o N wport R I n J uary 1951 wh n th pr ipal inv t gator w s on es r train g duty Th othe in tigat w r ttached t the taff of th N urop y hi tr Serv ce of th Med cal Departm t f th Train g Stat on. C mma d r R bert R D en MC USN th n Ch ef of th N ur p ych tr U t, d d the psychiatr x minatio of th 712 m n i ol ed th tudy

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(4) A psy h tric usp ct def ned by Comma d r R bert R D n MC USN s r crui wh in bri f psych tric i terv w giv nd c ti ns f emoti nal di turba or pers nal ty patterns wh h might h nder his adjustm nt to nav l s rv

(5) W d r A et l Manual for the C rnell Ind x P y h l gical Corp rat on N w Y k N Y 1948 pp 3 6

No such effectiveness is apparent for the screening of suspects in our study Table 2 gives the percent of suspects and nonsuspects identified as rejects" at various cut-off levels of the Cornell Index If we screen all men with a score of 1 or more we obtain 75 percent of the suspects and 50 percent of the matched nonsuspects thus we will fail to identify one quarter of all suspects while examining one half of all matched nonsuspects Placing the screening point higher merely increases the number of suspects not screened without further compensation in the number of errors in designation made

TABLE 1 *Distribution by grade and duct of sample of 356 suspects*

Education (years)	Age (years)								Total	Median grade
	17	18	19	20	21	22	23	28		
6	0	1	1	1	0	0	0	0	3	–
7	2	3	1	3	2	0	0	0	11	19
8	3	5	6	5	5	0	0	1	25	19
9	4	12	9	5	2	0	0	0	32	19
10	9	12	18	15	7	1	0	0	62	19
11	3	10	11	12	6	0	1	0	43	19
12	2	15	45	59	24	2	0	0	147	20
13	0	0	2	10	5	0	0	0	17	20
14	0	0	1	6	2	0	0	0	9	20
15	0	0	0	1	5	0	0	0	6	21
16	0	0	0	0	1	0	0	0	1	–
Total	23	58	94	117	59	3	1	1	356	20
Median	10	10	12	12	12	–	–	–	12	

Years old

At the recommended cut-off level of 7 or above 17 percent of the suspects and 4 percent of the nonsuspects were screened Thus we see that the subjects in our "suspect sample have much lower scores than the Army inductees used in the validation process Another cut-off point suggested 13 is even less useful (although it is true that *all* 14 men in our matched samples with a Cornell Index of 14 or above were designated as suspects)

On the other hand we may establish the significance of the differences between the Index scores of the suspect group and the matched nonsuspect group The distribution of the differences between each matched pair is given in table 3 A *t* test

performed on this data shows the average difference of 2 16 to be highly significant (t 8 09), but 78 pairs, or nearly one-quarter, presented a higher score for the nonsuspect, and only 57 percent of the pairs showed a higher score for the suspect Table 4 shows the score at each quartile for the suspect and nonsuspect groups The median difference between pairs is +1 05 and only slightly more than one-quarter of the pairs have a difference of over +4

TABLE 2 *Percent of suspects and nonsuspects screened at various cut-off levels of the Cornell Index*

Cut-off level	Suspects	Nonsuspects
0	100	100
1	75	50
2	58	30
3	45	20
4	36	13
5	29	10
6	22	5
7	17	4
8	14	3
9	11	2
10	9	2
11	7	1
12	5	1
13	5	0
14	4	0
15	3	0
16	3	0
17	2	0
18	2	0

Everyone w th a score equ l to or above the cut-off level is examined further

EXAMINATION OF INDIVIDUAL ITEMS

Next we tabulated the results for each of the 100 individual items on the Cornell Index All items except No 20, 69, 82 and 87 should "ideally" be answered negatively The number of inappropriate answers for each item, for the two samples, are presented in the appendix (6) Because the samples were matched

(6) Th mpl t p nt t on f th number f inapp opriate r spons to each t m f th tw mpl s was too l ngthy to be i cluded n this paper and may be bt d by wr t ng to the semo uthor

TABLE 3 *D trib t of d ffer nc th Corr ll Ind sco for match d pa s of usp cts and nsusp ct*

Diff e	F q cy	Cumul ti p ceat
+20 t 29	4	1
15 t 19	8	3
10 t 14	15	8
7 to 9	22	14
6	10	17
5	23	23
4	21	29
3	21	35
2	34	44
1	45	57
0	75	78
−1	30	87
−2	11	90
−3	13	93
−4	8	96
−5	6	97
−6 t −11	10	100

Obt ined by ubtrac ing the sc t f th p from th t of th su p t for h m t hed pair

$$t = \frac{\sqrt{N-1}\,(M_1 - M_2)}{\sigma_d} = 8.09$$

$P < < .01$

TABLE 4 *Quart l f C rnell Ind c re for usp ct and nsusp t d d ff b tw mat b d p r*

Quartil	C. I s		D ff b tw n m tch d pair
	S pe t	N ns pect	
Q_1	0	0	−0 5
Q_2	2	1	+1.05
Q_3	5	2	+4 2
Av ge of given or	3 56	1 4	+2 16

TABLE 5 *Total number of items checked inappropriately for various areas on the Cornell Index for suspects and nonsuspects with probability ranges for significance of given ratios*

	Items	Number checked inappropriately			Ratio of suspects to total	P_1 for 5% significance
		Suspects	Nonsuspects	Total		
Fear and inadequacy	2 19	433	159	592	731	< 695
Depression	20 26	96	39	135	711	< 630
Nervousness and anxiety	27 33	121	41	162	747	< 675
Neurocirculatory symptoms	34 38	61	24	85	718	< 615
Startle reaction	39-46	89	31	120	742	< 657
Psychosomatic symptoms	47-61	132	66	198	667	< 599
Hypochondriasis and asthenia	62 68	92	33	125	736	< 653
Gastrointestinal symptoms	69 79	96	17	113	850	< 772
Sensitivity and suspiciousness	80-85	115	57	172	669	< 596
Troublesome psychopathy	86-101	82	50	132	621	< 536 > 699
Total	2 101	1317	517	1834	718	697

for age and education it is permissible to compare the totals for each item for suspects and nonsuspects The tabulation of items is summarized here We present the ratio of the inappropriate responses checked by suspects to the total number of such responses Then using the binomial approximation and the 5 percent level of significance we may test this ratio by the formula

A significant ratio is a ratio greater than

$$p_1 + 1\ 96\sqrt{\frac{p_1(1\ p_1)}{N}}$$

Because the experiment is not an independent experiment we have no way of knowing what p_1 is The psychiatric examiners use the Cornell Index in their examinations and presumably are influenced by each score and by the responses to the individual items but to what extent no one knows An independent experiment is difficult in practical work If the Index were not used p_1 would be 0 5 that is a subject giving an inappropriate response to any item would have a 50 50 chance of being declared a suspect Thus if any ratio were significantly greater than 0 5 we could define the item as definitely tending to identify suspects

On the other hand if the score were used exclusively to identify suspects the ratio of the total reported score for all suspects to that for all matched pairs i e $p_1 \quad \frac{1317}{1834} \quad 0\ 718$ would give the chance that a man with a given inappropriate response would be declared a suspect The truth must lie somewhere between the extremes of 0 5 and 0 718 and it is up to the reader to make his own judgment We compared the computed ratio for each item to various values of p_1 and found that 37 of the 100 items had ratios significantly greater than 0 5 29 had ratios significantly greater than 0 55 17 had ratios significantly greater than 0 6 7 had ratios significantly greater than 0 667 and 3 had ratios significantly greater than 0 718 On the other hand 4 items had ratios significantly *less* than 0 718 and 2 of these were significantly less than 0 667

The items which designate significantly more suspects than expected by chance were examined and the following observations were made

A Significant at $p_1 = 0\ 718$

		Ratio
6	Do you often have spells of dizziness?	1 000
72	Do you frequently get attacks of nausea?	950
83	Do you have the feeling that people are watching or talking about you in the street?	913

None of the so-called "stop" items *(5)* appear in any of these lists since so few respond inappropriately to them The "stop" items (No 32, 33 55 57, 78, 79, 88, 90, 91, 93, and 95) could not be considered in a sample less than 3 times the size of this one Items 6, 72, and 83 are important according to Navy standards, indicating vasomotor instability, "nervous stomach," and paranoid feelings respectively

B Significant at $p_1 = 0\ 667$ but not at $p_1 = 0\ 718$

		Ratio
11	Do you feel nervous or dizzy right at this moment?	804
27	Are you considered a nervous person?	800
47	Do you suffer badly from frequent severe headaches?	1 000
71	Do you often suffer from an upset stomach?	885

These items are also basic by Navy standards Of the 7 items of greatest validity, item 27 is most often answered inappropriately by suspects, being answered thus by 13 5 percent of all suspects

C Additional key items which differentiate suspects from non suspects

		Ratio
16	Do you have to do things very slowly in order to be sure you are doing them right?	760
29	Do you often have difficulty in falling asleep or staying asleep?	813
66	Does pressure or pain in the head make it hard for you to perform your duties?	875

Note that item 66 is one of several which are ambiguous It is often answered as if worded "Would pressure or pain " We can thus have a list of 10 key items, all except 2 with frequently given inappropriate responses, which we can use to spot" suspects

D Items which definitely do *not* differentiate suspects from nonsuspects

(1) Significant at p_1 0 667 and above

		Ratio
82	Have you usually been treated fairly? (*No* is inappropriate)	543
96	Do you always do things on sudden impulse?	484

(2) Significant at p_1 0 718 but not at p_1 0 667

20	Do you usually feel cheerful and happy? (*No* is inappropriate)	564
51	Have you at times had a twitching of the face head or shoulders?	592

Because there are so few items for which yes is the appropriate response many of the so-called inappropriate responses for No 20 and 82 are errors by the examinee On the other hand No 69 and 87 also positively worded do *not* display this phenomenon to any great extent

E Areas i e grouping of items

When the items are grouped according to instructions *(5)* we find that gastrointestinal symptoms are most important with fear and inadequacy nervousness and anxiety startle reaction and hypochondriasis and asthenia also above the general average (table 5) On the other hand troublesome psychopathy psychosomatic symptoms and sensitivity and suspiciousness are definitely below the general average Owing to the large contribution which certain items make to some of these tables these results do not seem to be of much importance

SUMMARY AND CONCLUSIONS

A study was made of 356 naval recruits who appeared on the basis of a brief psychiatric interview as being worthy of further psychiatric examination to determine their potential adaptation to the demands of the naval service Each of these men was matched by age and education with a man who was designated as being fully qualified for naval training The Cornell Index had been administered prior to the examination and was available for use by the psychiatric examiner The responses of the 712 men to the 101 items on the Index were analyzed to determine on the basis of the short interview and with the psychiatric examiner s use of the Index which types of psychiatric problems appeared to be most significant in aiding the examiner in his prediction

We believe that the value of the Cornell Index as a screening device is insignificant, but that it is helpful in the psychiatric interview in focusing attention on certain important "key" items The value of the present study lies in the fact that it has given empirical demonstration of the comparative values of various items in designating psychiatric suspects Inappropriate responses were more frequently given to items 6, 11, 16, 27, 29, 47, 66, 71, 72, and 83 by the suspects than by the nonsuspects Further surveys of the discriminating value of the Index (N 2) will have to be made under independent conditions, i e , without letting the psychiatrist examine each man's Index

BOOK REVIEW

Contributions Toward Medical Psychology Theory and Psychodiagnostic Methods edited by *Arthur Weider* Ph D Associate Professor of Medical Psychology Department of Psychiatry and Mental Hygiene University of Louisville School of Medicine with 53 contributors Foreword by *David Wechsler* Ph D Associate Clinical Professor of Medical Psychology New York University College of Medicine Chief Psychologist Bellevue Psychiatric Hospital Volumes I and II 855 pages 101 illustrations The Ronald Press Co New York N Y publishers 1953

These 2 volumes are a compendium of abridged articles previously published and some specially prepared articles selected by the editor as contributions *toward* the field of medical psychology The contributors include distinguished physicians, psychiatrists, anthropologists, and psychologists The work is in 4 parts The first 3, comprising Volume I, are concerned chiefly with general concepts of the role of psychology in medicine Part I, Psychology and Medicine, consists of an article by Gregg and one by Alexander Part II, with contributions by Ellis, Gessell, Ammons, Kluckhohn, and Mowrer, discusses psychologic theories, developmental concepts, motivation, personality, and concepts of normality Part III contains articles on psychosomatic problems These include a group of psychosomatic concepts and approaches by Halliday, Whitehorn, and Cobb, followed by excerpts from the research of Selye, Sontag, Wolf, Wolff, Mead, Ruesch and Bowman, Greenblatt, and Rusk

Much of the material in this volume is well known The selections sampled from the literature of the past 10 years, are for the most part well chosen to represent important work and important names There is a question, however, as to the adequacy

of sampling for the purpose indicated by the title of the book Psychologic concepts and contributions are given cursory treatment while extensive space is devoted to clinical studies in psychosomatic medicine Mowrer's article, "What is Normal Behavior?" which is a highlight of a previous compendium on clinical psychology is appropriately included in the present collection

The second volume comprising all of Part IV is entitled *Psychodiagnostic Methods and Medical Practice* The second part of this title might better have been omitted *It* is a comprehensive survey of the armamentarium of clinical psychology and includes without discriminating representative samples of the best scientific developments and other more intuitive or speculative work in this field A generally uniform plan of presentation is followed for each instrument covering purpose uses description rationale and standardization Twenty nine different technics 2 developmental procedures 4 tests of intelligence 2 personality questionnaires 10 projective procedures, 7 tests of conception and intellectual impairment and 4 other psychometric instruments are described in this way Although some of the articles are objective and include or refer to supporting data this is not uniformly done The total impression of a wide range of equally useful instruments is probably not justified and the limitations are not pointed out. The final chapter on psychodiagnostic methods at work is an interesting and useful demonstration of clinical diagnosis by psychologic methods presented by a group of specialists in the several technics

This work will be most useful as a general survey reference Its treatment is too brief and in some cases too condensed for a text or manual and it fails to guide the reader critically with reference to the limitations of the methods presented in Part IV As an approach to medical psychology its shortcomings are greatest Volume I leans heavily on psychiatry and Volume II, on clinical psychology but the 2 together do not constitute a *medical* psychology The printing and index are generally good but a number of unfortunate typographic errors in the text and tables were found It is regretted that the references, citing original publications of articles reprinted or abstracted are not shown in the individual sections This omission may mislead many readers concerning the priority or source of specific sections.—*S B Sells Ph D*

BLOCK THERAPY OF THE SYMPATHETIC NERVOUS SYSTEM[1]

CHARLES H GILLESPIE *M. D*

JOHN A HENDERSON *Major USAF (MC)*

THE sympathetic and parasympathetic components of the autonomic nervous system are antagonistic balances which regulate the various organs of the body The parasympathetic or craniosacral portion conserves and restores body resources the sympathetic portion prepares the body for mass activity The parasympathetic nervous component is not associated with pain disturbances per se Vagotonia is a medical problem which is treated by drugs, except that vagotomy may be performed for gastric, pulmonary, pancreatic, or biliary conditions The sympathetic nervous component contains pain fibers Pain can be relieved by appropriate interruptions of the nerve pathways by block therapy or by other surgical means

INDICATIONS

The indications for sympathetic block therapy [2] are acute or chronic vascular occlusion and pain

Early cervical sympathetic blocks should be used in the treatment of cerebral thrombosis and embolism Block therapy should be continued until it gives no further benefit. A lumbar puncture is performed when the patient is admitted to the hospital If the spinal fluid is grossly bloody, denoting hemorrhage rather than thrombosis or embolism, cervical sympathetic block is contraindicated for at least 24 hours If the spinal fluid is clear, sympathetic block therapy may be instituted immediately This procedure frequently is followed by marked beneficial results, especially if it is instituted within the first 4 to 8 hours after the onset

Trench foot, immersion foot, and frostbite have been treated with sympathetic block therapy with questionable results The most important factor in the treatment of these conditions is the early application of this treatment. Sympathetic block should be performed as soon as possible after the diagnosis is made

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(1) Scott d Wh t Clinic T mpl T

(2) Ochs r A I dicat ns for sympath tic n rvous system block. Anesth & Analg 30 61 75 Mar Ap 1951

Acute pulmonary embolism is a medical emergency in which an immediate cervical sympathetic block may save life The mechanism by which a clot that lodges in one or more pulmonary arteries causes death is unknown It has been shown that reflexes initiated by the embolus may cause severe arterial spasm, bronchospasm, and cardiac disturbances (3) Some of these reflexes have their afferent pathways over the sympathetic chain and they may be interrupted by a cervical sympathetic block of the involved side

Sympathetic blocks are frequently used in causalgia to relieve severe burning stinging pain excessive sweating glossy discoloration and cold extremities The value of blocks in sympatheticalgia or minor causalgia, is less well known Patients with this condition complain of a burning pain which is less severe than true causalgia, but still incapacitating Because this condition frequently follows a minor injury a neurosis or malingering may be suspected Sympathetic blocks are frequently effective in the relief of this type of pain and should be performed on a diagnostic as well as a therapeutic basis

The shoulder hand syndrome consists of pain and limitation of motion in the shoulder with pain and swelling in the hand It occurs frequently in patients with coronary heart disease but is not limited to them These patients obtain complete relief after a few successful blocks (4) Phantom limb sensations are a therapeutic problem for all who treat amputees Sympathetic block therapy occasionally gives relief to these patients Brachial plexus and low spinal blocks, chordotomy, lobotomy and psychiatric interviews have been used for this condition with equivocal results

Vague abdominal pain and that of pancreatitis and cholecystitis may be relieved by splanchnic block This procedure should never be a substitute for indicated abdominal surgery

CONTRAINDICATIONS

There are few contraindications to sympathetic block therapy for the trained physician We use a 1 to 2 percent solution of procaine and efocaine as blocking agents Procaine sensitivity is manifested by pallor bradycardia hypotension sweating, nervousness and tremor which may progress to convulsions Oxygen and a quick acting injectable barbiturate should be administered immediately Anderson et al (5) have advised the

(3) Carr D nd Cha dl H Dor l ympatheti ga gl on tomy for tra nbl thma J Th ra c Surg 17 1 12 F b 1948
(4) S brocker O Sp tz N d F dma H H Tr tme t of h ulder-ha d yn drom (fl dy tr phy of ppet r m ty) w h pe ial r f enc t ympathetic block pr l m nary port A th & Analg 27 273 278 S pt-Oct 1948
(5) Ander R M Cr w ll D P Twigg E J nd Fly n, J H Diagno tic and h peut erv bl ks 2 ye ew Anesth & Analg 29 315 329 Nov De 1950

use of 100 mg of pentobarbital sodium 1 hour before the injection of procaine as a prophylaxis This has not been necessary in our experience Because of the possibility of injury to a blood vessel resulting in a hematoma, sympathetic blocks are contra indicated in patients receiving anticoagulant therapy Sympathetic blocks are not attempted until the prothrombin, bleeding, and coagulation times have returned to normal Care should be taken to prevent intravascular and intrathecal injection of the anesthetic drug

TECHNIC

To treat adequately conditions for which sympathetic block is indicated, the physician must be able to perform cervical or stellate ganglion, splanchnic, and lumbar sympathetic blocks The anesthesiologist should be charged with the responsibility for block therapy, but any physician who treats these medical and surgical problems should be able to perform sympathetic blocks

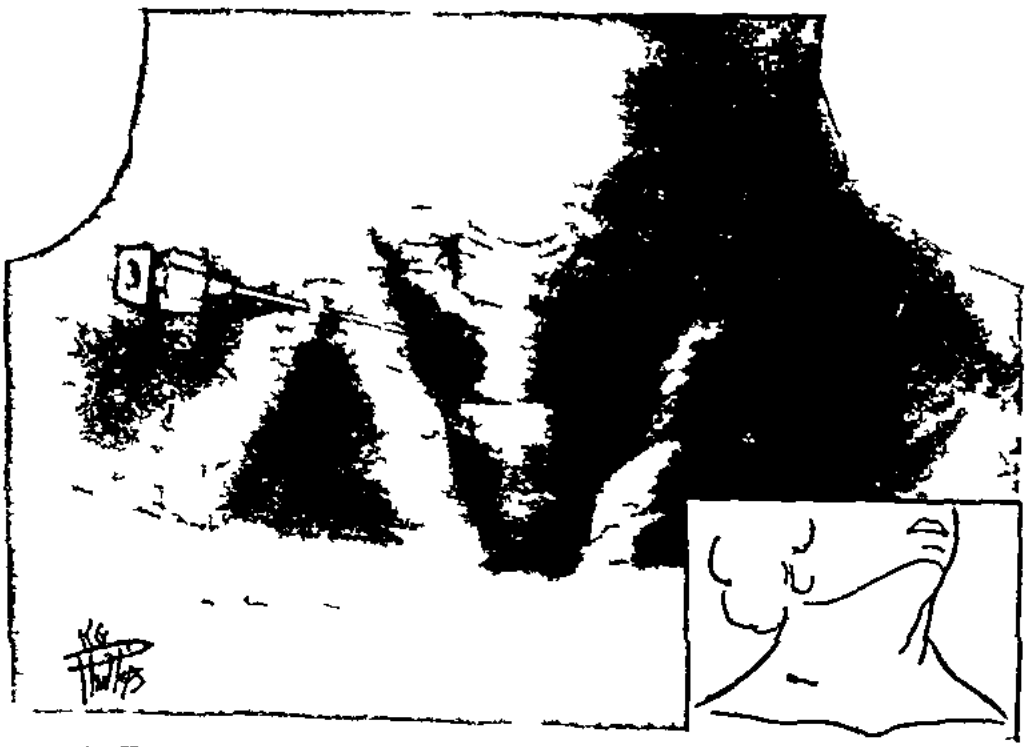


Figure 1 Technic of right cervical sympathetic block. The needle should be directed more posteriorly than it appears in the drawing and should not go beyond the midline

Cervical or stellate ganglion block The sympathetic innervation to the brain, head, neck, upper extremities, and thoracic organs is blocked by this procedure The patient's head is turned to the opposite side with the chin extended slightly A point about 3 cm above the clavicle at the apex of the triangle formed by the sternal and clavicular heads of the sternocleido-

mastoid muscle is selected (fig 1) At this point a skin wheal is raised with 1 percent procaine solution A 22 gage spinal needle is inserted medially and slightly caudad until it strikes the lateral border of the body of the sixth or seventh cervical vertebra After aspirating the syringe to make sure that the

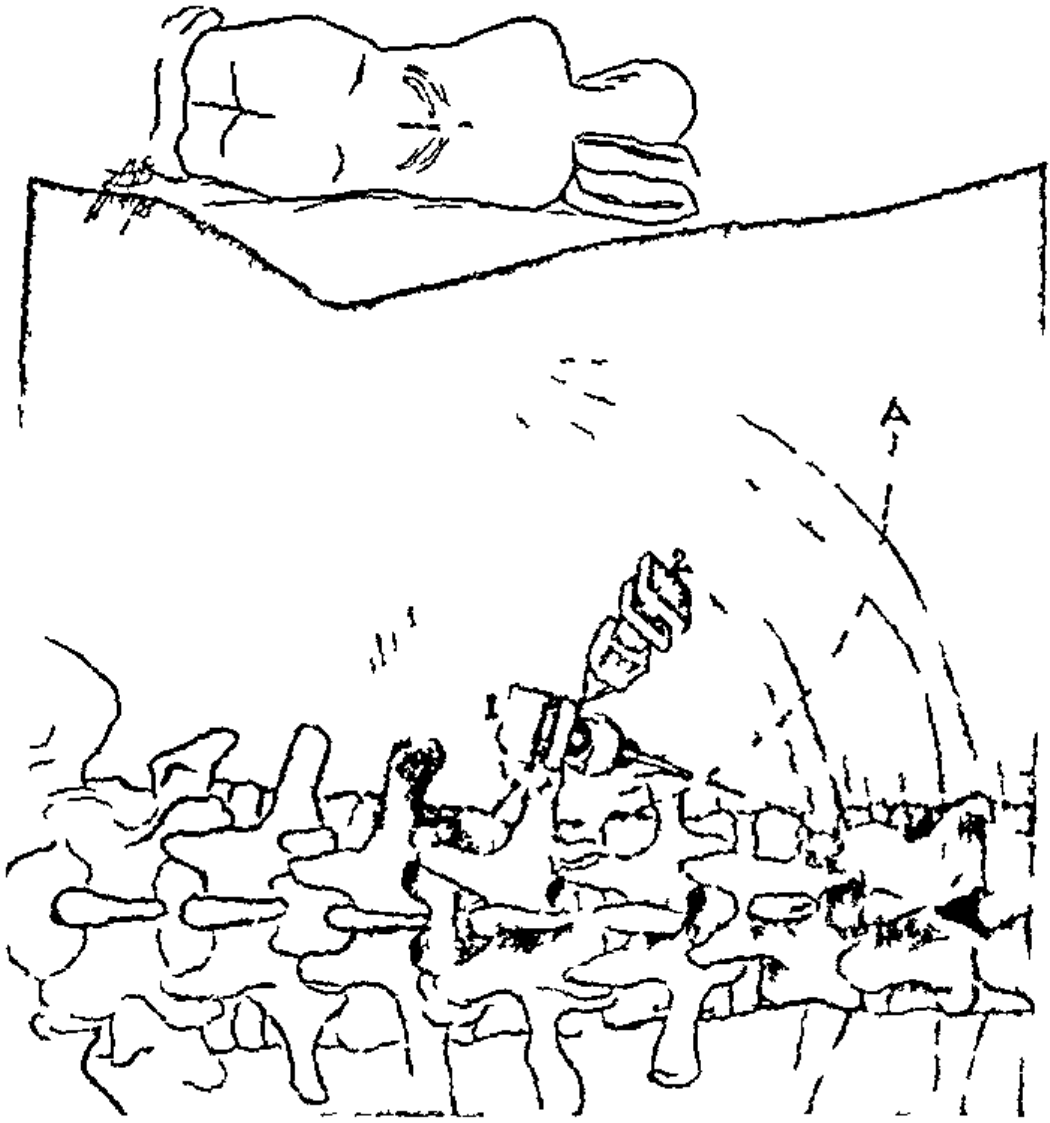


Figure 2 Technic of left planchnic and lumbar block. Needle 1 is shown after being withdrawn from the cephalad border of transverse process of the first lumbar vertebra, but should be directed more perpendicularly to the body that is shown here. Needle 2 is shown after being withdrawn from the caudad border of the transverse process of the second lumbar vertebra. Line A denotes the position of the diaphragm. Injection above the insertion of the diaphragm will result in a splanchnic block below, in a lumbar block. Inset shows position of patient for performing these blocks.

needle is not placed intravascularly or intrathecally from 10 to 15 cc of a 1 percent solution of procaine are injected. If a longer acting block is desired the needle is left in place until

the signs of an effective block are present and then from 5 to 10 cc of efocaine may be injected It is advisable to inject the procaine solution prior to the efocaine to minimize the discomfort of the latter The period of effective block will be decreased by this method, depending on the amount of procaine injected Bilateral cervical blocks should not be performed at the same time because of the danger of bilateral pneumothorax and bi lateral vocal cord paralysis

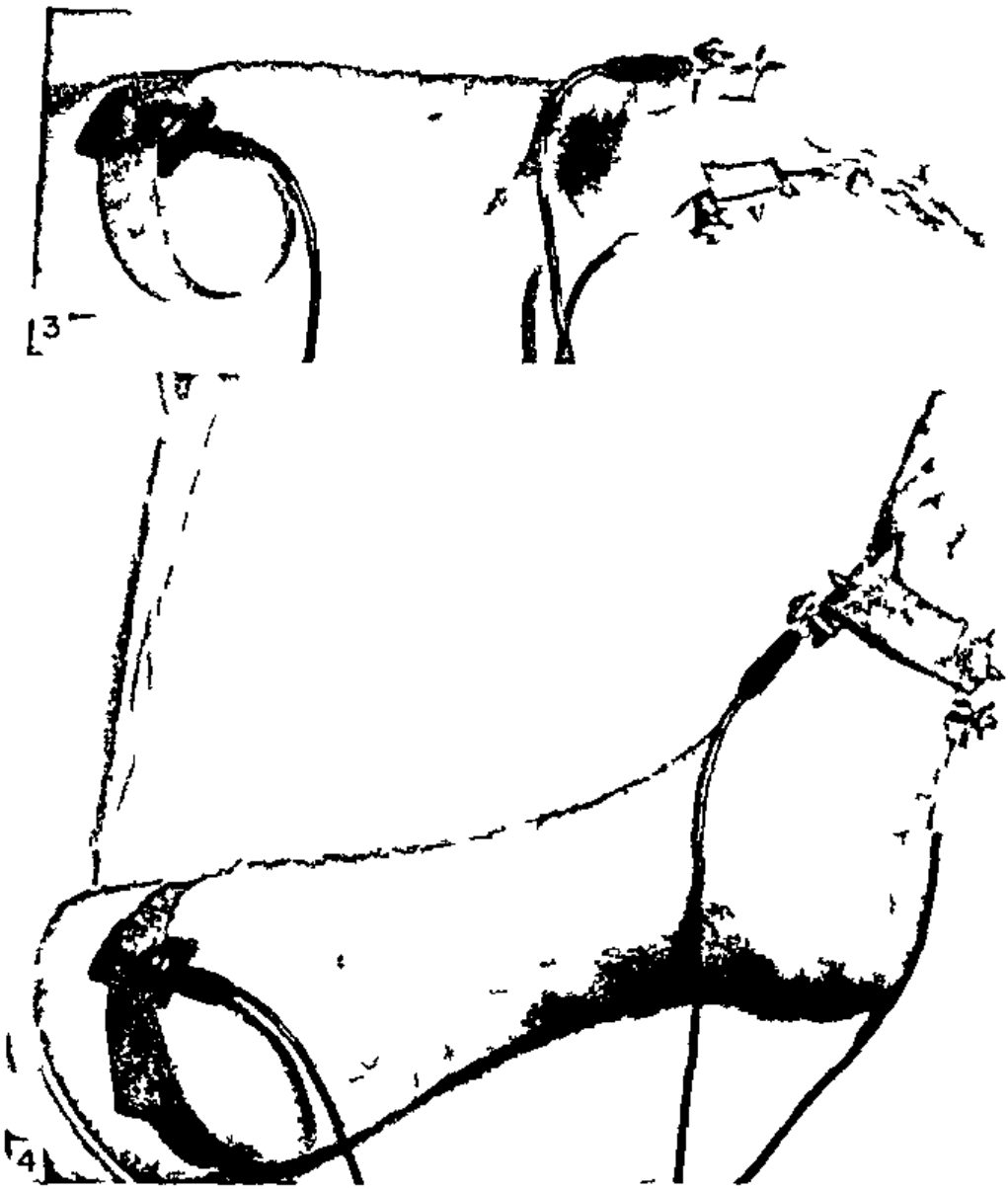
Splanchnic sympathetic block By this procedure the sym pathetic innervation to the abdominal viscera is blocked The patient is placed on his side with his back slightly flexed A point about 3 cm lateral to the interspace between the twelfth thoracic and the first lumbar vertebra is selected and a skin wheal is raised with a 1 percent solution of procaine A 22 gage spinal needle is inserted perpendicular to the skin until it strikes the transverse process of the first lumbar vertebra The needle is then "walked off" the upper border of the transverse process and passed more deeply until it strikes the body of the vertebra (fig 2) The needle is redirected until it barely passes beyond the lateral border of the vertebral body where it will be close to the splanchnic chain From 20 to 30 cc of a 1 percent solution of procaine are injected If the pain is relieved, from 15 to 20 cc of efocaine are injected for a longer lasting block Caution should be exercised in this block because the needle is intro- duced in the same direction as the opening of the intervertebral foramina and an intrathecal injection might be performed

Lumbar sympathetic block By this procedure, the sympathetic innervation to the lower extremities is blocked The patient is placed on his side as for a splanchnic block A skin wheal is raised at a point about 3 cm lateral to the interspace between the first and second lumbar vertebras A 22 gage spinal needle is inserted perpendicular to the skin until it strikes the transverse process of the second lumbar vertebra The needle is "walked off" the caudal border of the transverse process and is directed more deeply until it strikes the vertebral body The needle then is directed more laterally until it clears the lateral border of the body (fig 2) After aspirating the syringe, 20 cc of a 1 percent solution of procaine are injected If a satisfactory block is per formed from 10 to 15 cc of efocaine may be injected before the needle is removed

TESTS FOR EFFECTIVENESS OF BLOCK

Constriction of the pupil, ptosis of the upper eyelid absence of sweating of the face and upper extremity, and an increase in the temperature of the face and upper extremity will appear following a successful cervical block. Relief of the visceral

abdominal pain is the only evidence of a successful splanchnic block Increase in temperature and absence of sweating of the lower extremity may be noted following a successful lumbar block



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The signs following an attempted sympathetic block sometimes are equivocal In patients on whom a block has been attempted the psychogalvanic reflex should be determined This method of testing the success of a cervical or lumbar sympathetic block requires a direct writing electrocardiograph *(6)* The right and

(6) Al xa d D d L w s L P nal mmunicat n.

left arm leads are placed on the ventral and dorsal surfaces, respectively, of the hand or foot of the extremity in question (figs 3 and 4) The machine is grounded in the usual manner and turned to lead I The patient is stimulated by a sharp object over any portion of the body If the sympathetic nerves have been

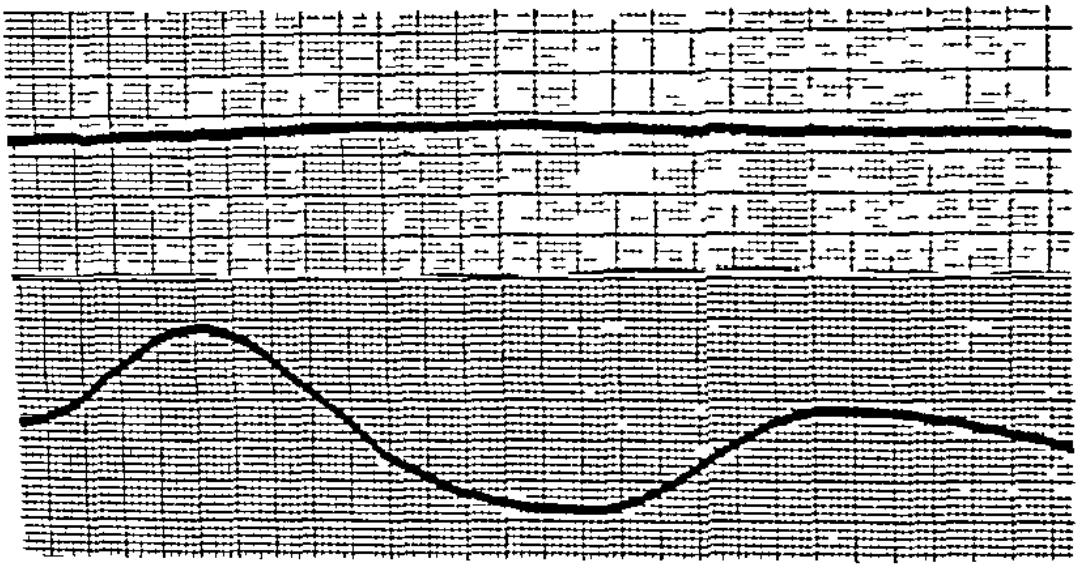


Figure 5 The upper electrocardiographic tracing denotes a successful sympathetic block. The lower tracing indicates normal sympathetic nervous activity

blocked, the tracing will be flat. If the sympathetic nerves are intact, the tracing will show a definite, gradual curve following each stimulation (fig 5) The opposite extremity should be used as a control Barbiturates and narcotics depress the psychogalvanic reflex

BOOK REVIEW

Operative Gynecology by *Richard W TeLinde* Professor of Gynecology Johns Hopkins University and Chief Gynecologist Johns Hopkins Hospital 2d edition 902 pages 409 black and white illustrations 7 color plates J B Lippincott Co Philadelphia Pa publishers 1953 Price $20

In the 7 years since the first edition, this splendid work has become a standard reference work in its field The revised edition is indeed welcome to all students of gynecology The new volume contains 150 more pages, 100 new illustrations, and 5 important new chapters These new chapters are Use of Pes

saries, Surgery of the Double Uterus Culdoscopy, Carcinoma of the Cervix in Situ, and Sarcoma of the Uterus There has been a helpful change in the make up of the new edition namely that major subheadings of chapters have been more clearly identified by capitalized headings and are not merely indicated in the text by italicization This excellent work is recommended to all medical libraries of hospitals conducting intern and resident training programs Its value to the specialist and the general surgeon is inestimable

The chapter on the use of pessaries is of particular help to hospital residents about to set out in practice The usual hospital experience does not include much training in the employment of that valuable device The new chapter describing surgery of the double uterus is of great aid to the gynecologist in handling the occasional cases suitable for surgical treatment. The information contained therein is available in few texts The value and interpretation of Papanicolaou smears has been clearly presented TeLinde s background of 20 or more years of experience with the controversial problem of carcinoma of the cervix in situ has produced a very valuable chapter By the time a third edition is published the proper identification and treatment of this entity should be still more firmly established The discussion of treatment of endometrial hyperplasia in the chapter on functional uterine bleeding has been rewritten and brought up to date The short chapter on sarcoma of the uterus will be of assistance to the specialist The section on that very valuable and practical procedure for properly selected cases, presacral neurectomy, is enhanced by the added discussion of ovarian denervation

It is interesting to note the trend of the times in the omission of the rather detailed discussion which appeared in the first edition regarding the technic of the administration of sulfonamides in gonorrheal infections of the lower genital tract in favor of antibiotics The chapters on culdoscopy and hysterography and hysterosalpingography with splendid illustrations in the latter chapter present refinements in diagnostic technics which should be considered by every progressive gynecologist It is with regret that we note the omission of several fine color plates in the chapter on ovarian tumors It is assumed that this is one of the concessions made to permit the inclusion of many excellent new features —*Lt Col W Cooley Jr USAF (MC)*

PSYCHIATRIC SELECTION OF WOMEN FOR NAVAL SERVICE[1]

JOHN J EBERHART *Captain, MC, USN*

CHARLES W SOCARIDES *Lieutenant, junio grade MC, USNR*

IN November 1951, following the opening of the WAVE Recruit Training Center at this naval base, it became increasingly apparent to the neuropsychiatric section that more efficient measures should be taken as regards the psychiatric evaluation, care, and disposition of WAVE recruits It was, furthermore, deemed essential that the psychiatric standards for women duplicate those existing for men, but that the differences in manifestation of psychiatric disorders in men and women must be considered Until adequate physical facilities and sufficient trained personnel were made available, the following temporary procedure was instituted

AVE recruits were seen in the physical examination line by the screening psychiatrist and, if severely emotionally ill, would be hospitalized at the naval hospital There were many recruits, however, who did not appear to be sufficiently ill or maladjusted to require separation from the service or hospitalization On the basis of a brief psychiatric interview at the time of initial screening, these recruits were placed on a full duty or trial duty status The trial duty groups returned for further evaluation at different stages of their training At any time, WAVE recruits could be returned to full duty status without subsequent interviews If a recruit showed increasing maladjustment to recruit life as manifested by the eruption of a pathologic personality type or immaturity reaction, she would be returned to her company until the next aptitude board meeting At that time her adjustment would be discussed and recommendation for discharge for unsuitability or return to recruit training was advised Those who expressed their maladjustment in terms of physical complaints without organic cause would be admitted to the dispensary for the period of their acute discomfort If discharge was recommended, they would be immediately transferred to a separation center

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(1) U S N al Tra ni g C te Ba nbr dg Md.

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PSYCHIATRIC SCREENING

In January 1952 with the completion of adequate physical facilities the procedures now used and which thus far have proved most effective were begun Our working hypothesis has been that under the stress and strain of military routine and regulation there is an aggravation or accentuation of underlying personality difficulties with the resultant evidences of inability to cope with the demands of a new and regulated environment. Thus somatic or psychic complaints and progressive adaptive failure as evidenced in poor performance in recruit training will appear depending on the Wave s ability successfully to cope with minor stress and her willingness to conform to military life A plan therefore was evolved in which there was set up a WAVE neuropsychiatric unit which encompassed some aspects of the former method as well as those which were considered to be substantial improvements

Recruits originally placed on trial duty status are recalled to the unit for further evaluation after 3 weeks of training A report from the company commander is made available to the psychiatrist to assist him in determining the adjustment of the recruit to training This is an invaluable aid in many instances because it contains a description of the recruit s progress as regards response to military regulations Her social adjustment ability to learn from experience control over her emotions (especially fear and anger) and her ability to use her free time and to be a well adjusted recruit are commented on Furthermore her degree of reliability obedience and aptitude for military life can be ascertained This leads the examiner to an investigation in the crucial area of difficulty which could ordinarily only be arrived at through prolonged questioning In addition many recruits would meet the questions of the psychiatrist simply with bland or negative responses as regards the presence of difficulties in adapting themselves Others would not be aware of the importance or meaning of their patterns of behavior Up to this point neither the recruit nor the company commander has been aware of the trial duty status of the recruit Likewise these recruits are not singled out in any way for special concern during their training hence this unbiased opinion of the recruit s functioning under active training, plus a psychiatric interview affords a portrayal of her ability to perform and adjust adequately in a military setting Therefore if any discrepancies are noted these may be corrected in time

At the time of the first trial duty interview the recruit is either removed from the trial duty designation or returned to a further trial period of training A subsequent interview is conducted about 3 weeks later at which time she may be admitted to

the unit because of obvious and progressive failure in recruit training, or finally cleared without further evaluation As basic training for WAVES lasts 9 weeks, a recruit may be seen 3 times if her performance and adaptation appeared borderline but, in the opinion of the examiner, did not warrant admission During these interviews, in addition to further evaluation, redirection of the recruit's attitude and energy or a quick solution to her emotional problems may be offered by the psychiatrist to enhance further adaptation to naval life This is one of the primary functions of the unit.

When a recruit is admitted to the unit, it is for purposes of further evaluation and of confirming the decision that she is unsuitable for further military training During this period of assignment to the unit, there is adequate opportunity to observe her and conduct intensive psychiatric interviews while she continues in a partial program of recruit training conducted in the unit. These recruits are not carried on the regular sick list and their training continues in part. Psychologic tests are given and interpreted by qualified psychologists in those recruits whom the psychiatrist considers as offering problems in disposition, diagnosis, or specific area of maladjustment On some occasions, a profound therapeutic effect is exerted through the physician recruit relationship Likewise, through the efforts of interested, efficient, and kindly personnel, renewed motivation for further training may be kindled to an adequate and realistic degree to justify returning the recruit to training When discharge from the naval service is indicated after thorough evaluation, the recruit makes a personal appearance before an aptitude board, which acts on the recommendation subject to the approval of the commanding officer, that the recruit be discharged by reason of unsuitability under honorable conditions The board is composed of qualified officers including the senior psychiatrist, assistant psychiatrists, clinical psychologist, WAVE line officer and a male line officer This board has the prerogative to return the recruit to training if its members make this decision A Wave returned to duty under these conditions is still followed through subsequent psychiatric interviews to check on her progress in training

THE WORKINGS OF THE WARD

In the unit there are ward rounds in the morning and evening which constitute, in essence a regular sick call where complaints are listened to and treatment or advice given Hours for exercise, lectures by recruit-training instructors on current events and history, and extracurricular activities of other WAVE recruits are made available to the WAVES in the unit The recruits march to and from activities have freedom of activity around the WAVE neuropsychiatric unit building, including athletic programs,

educational movies and movies on military life A library on the ward and an occupational therapy room aid the process of rehabilitation and the reduction of anxiety This period of observation has been found to be of utmost value in expediting an accurate evaluation of the individual recruit It is rarely possible to render a responsible decision on a Wave who is quartered away from the psychiatric unit Interviews held in unfamiliar surroundings are not conducive to objective evaluations particularly in matters which have serious implications for the person s future

SPECIAL PROBLEMS

Table 1 demonstrates several interesting differences in the male and WAVE recruits who are discharged from the naval service by reason of unsuitability Among the male recruits inadequate personality was the major nosologic group Passive aggressive and immaturity reactions with symptomatic habit reactions (enuresis) formed the next largest group The comparable data for the WAVES showed a lesser percent discharged in these categories No enuresis was reported among the WAVES This was not surprising in view of the fact that enuresis predominantly occurs in the male population Although an equal percent of passive dependent reactions were noted in the 2 groups the passive aggressive reaction type was almost 3 times as frequent in the male recruits

The bulk of the reaction types which formed the main basis for discharge in the WAVE population were emotional instability and schizoid personality These are the more profound psychiatric conditions in which the personality structure includes so many fine nuances

The differences described between the 2 groups of recruits were a result of the selective process itself The WAVE population, first of all, is a more select group in terms of educational requirements (twelfth grade or equivalent) Thus many of the usual problems such as illiteracy defective intelligence and general inadequacy were not as frequent in the WAVES Furthermore enlistment in the WAVES is entirely voluntary There is no impending draft which indirectly forces them into the naval service

Most WAVE recruits were actually aided by the new atmosphere of community living A sense of security and a feeling of belonging developed in some of them for the first time in life The rigid requirements of new parental authorities in a new more dependent way of life may offer additional strength in maintaining their emotional regulation in some instances On clinical examination therefore some recruits who appeared to suffer fro-

TABLE 1 *Male and WAVE recruits discharged by aptitude board 1 January 1952 to 30 September 1952*

	Male recruits		WAVE recruits	
	Number	Percent	Number	Percent
Types of pathologic personality				
Schizoid	84	9 9	19	17 3
Inadequate	281	33 0	21	19
Antisocial	35	4 1	0	
Sexual deviate (latent)	6	0 7	0	
Paranoid	2	0 2	1	0 9
Cyclothymic	2	0 2	1	0 9
Immaturity reactions				
Emotional instability	58	6 8	34	30 9
Passive-dependent	87	10 2	12	10 9
Passive-aggressive	119	14 0	6	5 6
Immaturity with symptom or character formation (enuresis)	104	12 2	0	
Aggressive reaction	17	2 0	0	
Disorders of intelligence				
Mental deficiency primary	3	0 4	0	
Specific learning defect (reading)	5	0 6	0	
Psychoneurotic reactions				
Anxiety	11	1 3	4	3 6
Dissociative	4	0 5	0	
Conversion	15	1 8	5	4 5
Phobic	2	0 2	0	
Obsessive-compulsive	0		2	1 8
Neurasthenic type	4	0 5	4	3 6
Somatization	11	1 3	0	
Total discharged by aptitude board	850	100	109	100
Number of man-months served	47 469		3 202	
Percentage of enlisted strength discharged by aptitude board	1 8		3 4	

The diagnoses used in this report are merely descriptive and purposive. All of the men and women met the minimal requirements of AR 40 115 and were certified for not less than basic training by a board of medical and survey. Statistical analysis prepared by Lt. (jg) Clifford H. Beck, MSC, USNR and Lt. (jg) Walter B. Lyon, MSC, USNR

moderate to severe emotional disturbances on initial screening later "pulled themselves together" under the protective atmosphere of their new military home The recruits who made the best adjustment rose rapidly in rate performed in a superior manner and showed no signs of emotional distress also presented a rather typical and well defined constellation of factors They had a strong capacity for emotional regulation and adaptation and were persons whose main conscious motivation for entering the service was the realistic search for self improvement which had been blocked through the lack of adequate avenues of expression and development such as productive stimulating job opportunities or suitable marriageable men in their home community It was evident that these reasons were not given merely as a rationalization on the part of the recruit

Other recruits, however, despite the presence of many fine attributes, have difficulty in making an adjustment to military life and should not be forced to accept the challenge of continued training Many of the latter have definite conscious or unconscious, pathologic, endopsychic conflicts which they have attempted to solve through entry into the service *Some try to* escape from a frightening situation with an overprotective mother Others revolt against parents and authority Furthermore some try to solve their adolescent rebellious impulsiveness to find a place in life and be someone " In others an inordinate desire for success in life based on underlying neurotic fears of failure and feelings of unconscious worthlessness may have been the motivating force for enlistment but the desire is usually *short-*lived because when duties and billets are inimical to the recruit's personality much frustration and disappointment are the *end results* In some the social and home surroundings seem to be intolerable while in others the struggle for education success in the economic world, and a search for a more sheltered and secure existence seem to be too difficult for them They try to solve their problems by enlisting in the military service but it is fortunate that most of these are finding military life a positive and enriching experience Those who do not adapt readily to this new and regulated way of *living which is so* necessary in a military setting may find the civilian milieu more tolerable after their experience in the service

The standards for retention of Waves are by necessity *higher* than those for male recruits In the male recruit *borderline* conditions may be more acceptable in view of the *various duty billets available in which* an adjustment may be possible but duty assignments for the WAVE recruit do not have this leeway for borderline adjustments Many of the PULHES 3 group areas the male recruits are able to perform adequately in general-duty billets for which there is no equivalent in the WAVES

Another problem which faces the WAVE unit arises from the fact that, unlike the male recruits, there are few methods of handling disciplinary problems Thus, WAVE recruits are referred to the unit because of disciplinary problems In such cases, the unit through psychiatric examination may uncover emotional disturbances which, if promptly alleviated, will facilitate improvement in general behavior Deep seated behavior disorders, however, do not lend themselves to quick solution

The WAVE recruit who is suddenly taken from recruit training and enters this unit presents a problem She may become disturbed at the interruption of her training This requires the tact, gentleness, and psychiatric approach that is necessary toward any person meeting a frustrating situation On numerous occasions, there is the added complication of a WAVE recruit not desiring discharge despite advice to the effect that she is not suitable for military life Attempts are made to influence the recruit to accept her discharge under honorable conditions and an attempt is made to decrease any feelings of shame or failure

CONCLUSIONS

The advantages of a WAVE recruit neuropsychiatric unit are

1 A continuous check on the adjustment of WAVE recruits in training is maintained by virtue of sufficient staff to handle the many emotional disorders seen in psychiatric examination This program is oriented for detection and, therefore, prevention of emotional breakdown in young women

2 Early but definite signs of maladjustment which otherwise would not come to the attention of the psychiatrist before much damage has been done to the recruit and to company morale are detected and admission is recommended

3 A realistic program, on the part of the company commanders and officers in charge of recruit training, directed toward a careful evaluation and observation of every recruit has resulted. The recruit s assets, liabilities, reactions to stress, potentialities for growth in the Navy, and the methods for possible improvement in her capacities are studied Those who would weaken the morale of the organization, who would have little to contribute, and who would only decrease the effectiveness of the WAVES are thereby constantly removed The WAVE recruit neuropsychiatric unit may be likened to the experienced and skilled mechanic who makes a periodic checkup of an automobile to detect beginning trouble in its machinery It is, thus, an important step in preventive military psychiatry

4 The transition between military life and return to civil life is softened to some degree, especially in WAVES [illegible]

sense of failure guilt, or shame at being found unsuitable for further military service

5 Severely ill recruits with suicidal tendencies severe depressive reactions or schizophrenic attacks are detected and hospitalized

6 During the period of evaluation and observation on the ward emotional difficulties can be explored and in some cases brief psychotherapy may be effective in returning a recruit to duty

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Clinical Applications of Radioisotopes

THE Special Training Division of the Oak Ridge Institute of Nuclear Studies has scheduled a second advanced course in the clinical applications of radioisotopes The course, to be held from 14 25 September 1953 will consist of lectures clinics and exhibits of equipment Subjects to be discussed include tumor localization circulatory volumes and outputs fluid and electrolyte spaces therapy of blood diseases theory of radiation dosimetry radioactivity measurement gold 198 and other colloids, interstitial and surface applications teletherapy iodine 131 in diagnosis and therapy and external counting Speakers selected are leaders in the specific fields of interest Participation will be limited essentially to those physicians who have had clinical experience with radioisotopes Information and application blanks may be obtained from the Special Training Division of the Institute, P O Box 117 Oak Ridge, Tenn.

PSYCHOSOMATIC DISORDERS IN THE SERVICE[1]

WILLIAM F MURPHY *Commander* MC, *USNR* [2]

THE development of our knowledge concerning stress, exhaustion, and alarm reactions and their relationship to the pituitary adrenal complex has greatly increased our knowledge of how certain psychosomatic syndromes occur, but as an etiologic agent, the hormonal substance is only one link in a long chain There is no general agreement on what is a psychosomatic disease Some believe that all of medicine is psychosomatic and others reserve the term psychosomatic disease for functional disturbances of an organ due to its inappropriate use for the solution of emotional difficulties The patient's use of his skin in certain cases of excoriative neurodermatitis would be an example of an illness on a semivoluntary basis, and the use of the stomach to express intensified passive oral needs to the point where a chronic gastritis was produced would be an example of an involuntary process Perhaps a better example of the latter would be certain cases of blepharitis that are connected with the denial of grief and which can be completely relieved by episodes of weeping Such an approach, however, is too atomistic and emphasizes the split in the concepts of psyche and soma Still others prefer to use the term "somatization reaction," which can apply either to organs of motility or internal organs One of the better definitions is that given by Deutsch *(3 4)* who stated that "psychosomatic medicine is the systematized knowledge of how to study bodily processes which have become fused and amalgamated with emotional disturbances in the past and in the present " This should be explained because its simplicity is deceiving

Our understanding of psychosomatic disease rests essentially on our understanding of why some persons tend to become organically ill in response to overwhelming stress, whereas others tend to develop a neurosis or a psychosis, or suffer a pathologic character change which is a surrender of certain highly developed

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(1) Read at the Medical Military Symposium, U S Naval Hospital Chelsea Mass 27 Oct b 1952

(2) Veterans Administration Hospital Boston Mass

(3) Deutsch F Unified psychosomatic concept in medicine Bull Johns Hopkins Hosp 80 71 85 Jan 1947

(4) Deutsch F Psychosomatic concepts Acta Med Orient 7 33-42 Mar 1948

and habitual inhibitions Although this question cannot be definitely answered theoretical speculations might be summarized as follows *Patterns of adjustment to stress* are laid down in the early formative years of life and crystallize in *certain character* patterns or habitual reactions which are never purely psychic but are interwoven with somatic manifestations i e mental attitudes and reactions are interwoven with complex vascular endocrine, and chemical reactions which are in part specific for the organism and in part a result of experience Deutsch *(5)* has labeled this process conditional dispositional fusion * This fusion involves the entire person but may manifest itself chiefly in one organ or organ system It involves more than the concept of the Pavlovian conditioned reflex and is nearer to the Gestalt concept Furthermore, like the Gestalt concept it is an entity in itself and can be reactivated either from the organic or the psychic side Accordingly all organic changes in the body, including illnesses, tend to activate certain psychic constellations involving thought, behavior and emotion

Likewise events arousing emotional attitudes previously associated with an organic illness will tend to activate certain organ syndromes This gives the phrase character patterns* a much wider meaning in terms of habitual reactions on the part of both the body and the mind Such patterns can roughly be classified as infantile adolescent, or adult. New patterns are constantly being superimposed in an inhibiting and controlling sense over the old In each case they are an exquisitely balanced combination of action structure thought and feeling These patterns can also be classified as abnormal or normal according to their appropriateness for the age of the individual and the mixture of impulsive emotional elements with logically verbalized elements The proportion of emotional elements and their physiologic repercussions are the crux of the problem Throughout life the emotions can be tamed and harnessed or denied and repressed They cannot be kept from occurring and from producing bodily changes which, when they rage out of hand may appear as a psychosomatic disease A psychosomatic illness in this sense means the revival of a distorted infantile character pattern of defenses against repressed emotions linked with certain past unbearable situational difficulties, the organic part being manifest and serving as a disguise or a vehicle for the emotional and ideational elements which remain hidden The term adult* simply implies behavior in keeping with common and socially accepted standards

Every person is a kaleidoscopic mixture of adult adolescent and infantile character patterns all interlocked and mutually

(5) Deutsch F Ch of orga orga n uro l tetnat J Psycho-Analy 20 252-262 July-Oct 1939

interdependent on one another for the maintenance of
vidual's unique personality Adult character patter
first line of defense against the anxieties and vici
life and work hand in glove with hidden but persiste
megalomanic feelings such as "harm cannot occur to
as I live a certain way " Emotional and physical t
losses of all kinds continually occur Such trauma c
a disintegration of the adult character patterns and a
infantile anxieties with physical concomitants whe
system bears an excessive load One of the most
proofs of this is the shift in the balance of charact
which is a personality change, due to the complicat
effects, and psychosomatic results of a severe injury,
escaped accident, or even an incapacitating organ

Is there a type of person especially susceptible to
somatic illness? Although anyone can be affected, the
person who is overly "adult" and unable to come to
his emotions is chiefly affected There are many s
who deny their emotions a satisfactory measure of
and who tend throughout the years to accumulate an
delayed emotional responses that press for discharg
particularly true when an expression of strong emotio
for at times such as death, marriage, divorce, birth
war experiences which throw the normal social o
ferment These persons place a great load on their de
mechanisms, and preserving mental and physical
becomes increasingly difficult for them as they ag
inevitable frustrations of life A blow to the hea
illness, or an emotional upset, according to their
ing, can act as the last straw to the overworked
mechanisms, both psychic and organic, and pr
of great severity This reaction appears often
"organic" form When it does, it means that th
is being used by the patient to derive gratifi
charge repressed and suppressed emotional
the gratifications are defensive, i e, th
conversion hysteria and prevents painful
memories from coming to consciousness
whether it is the head in patients with
headache or the lungs and chest in
becomes the central point of the patient's
related to this organ which belong to th
The illness itself becomes a part solu
and present difficulties and a defense
sity of facing real or fantasied personal

The relationship of physiologic homeostasis to its psychic counterpart can be demonstrated in a different way The homeostatic balance of hundreds of patients under intense emotional strain becomes so precarious that they show signs and symptoms of many incipient psychosomatic diseases *(7)* Such symptoms as musical rales joint pains of a transient nature injected sclera headache blepharitis extrasystoles diarrhea back pain and phosphaturia are legion and few people in the course of a lifetime fail to develop one or more of them One syndrome observed frequently among exhausted personnel from Guadalcanal consisted of the following stages (1) an increased contrast in red and white mottling of the palmar areas leading to (2) formation of pinpoint blebs in the white areas accompanied by itching and (3) secondary excoriation and infection Most of such patients with rest and local measures recovered before stage 3 was reached According to past conditioning and its usefulness in solving past problems any one of these transient physical states can be the early stages of a severe psychosomatic disease

Prevention is therefore the best remedy We remove the patient from the stressful environment and try to re-establish the adult defensive character patterns as quickly as possible Fortunately, this tends to occur by itself Mild disorders which comprise most of them need little or no treatment other than rest and change of pace The more severe disorders need a twofold type of therapy in addition to physical treatment. The patient s difficulties, both in the present and past, must be brought to his consciousness as a continuum He must be encouraged to develop a more realistic solution to his problems In this manner the affected organ system can be relieved of its psychic entanglements so that its physiologic responses will not be impaired o overburdened Sometimes it is difficult to distinguish the mild from the more severe disorders because the apparent strength of the personality of those prone to develop psychosomatic disorders makes an evaluation difficult

What confuses the issue is that in our civilization we tend t *overestimate the stability of compulsively oriented persons who are able calmly to intellectualize their way through life but who* appear to be especially susceptible to many psychosomatic disorders A major difficulty in dealing with these patients is their proneness to intellectualize and avoid emotional commitment. An even greater difficulty is the defensive reaction and the anxiety produced in them by any attempt to get them to discuss their emotional problems with a psychiatrist. This is due to the great regard they have for the intellectual processes the integrity of which is associated with deep-rooted anxieties and emotions

(7) H ll d y J I P ych oc l M d W W N n & Co I N w York \ Y 1949

concerning the integrity of their bodies Insight therapy is thus technically difficult and time consuming In one sense, the psychosomatic disease is the patient's last stand The interview situation not only threatens to deprive him of this but adds insult to injury This develops in the patient an enormous amount of aggression which poses a difficult technical problem or a complete surrender on the part of the patient who rapidly regresses to a passive, dependent, infantile character pattern which means a greater technical problem for the therapist, especially in a military setting where time is at a premium Peacetime psychiatric standards do not apply in treating most such patients In the military service, the secondary gains of any psychiatric illness are great. The receiving of psychotherapy, being placed on a neuropsychiatric ward, or having a psychiatric consultation tends to become an easy road to separation from the service and receiving disability compensation A more subtle danger is that the psychiatrist, with inadequate time to use insight therapy, may make a chronic psychiatric casualty out of a patient with a transient psychosomatic illness who if allowed to respond to simple measures could be returned to duty This point cannot be stressed too much A person who is allowed to escape easily from his duties via the psychiatric service cannot so lightly escape from his conscience which in the case of the person with a psychosomatic disease is more difficult than in the ordinary neurotic The problem is convincing himself that he really was very ill and he will remain ill as long as he doubts his own fulfillment of his standards of manhood

Deutsch *(8)* mentioned the problem of interviewing these patients and stated that a patient will reveal a great deal of information that is psychologically relevant to his psychosomatic illness only if he is unaware that we are interested in this material and especially if he is allowed to speak in an offhand manner Deutsch further remarked that the relief a patient experienced in being able to confide in someone was only temporary but nonetheless important. The value of placing a patient s mind at rest should not be underestimated. In a theater of war, this can be done more easily by a surgical or medical officer than by a known psychiatrist. Learning how to do this is easy for and invaluable to all medical officers

This leads to our program of treatment of psychosomatic illnesses Most important are rest and good medical care The psychologic repercussions of this are enormous Exact medical advice, ritualistic nursing care, administration of medicines, and scientific explanations to the patient are of great psychic value in relieving hidden anxieties The taking of medication

by mouth, and especially by injection has great significance beyond its physiologic aspects i e there are magic qualities to it which reach down to the most infantile strata of the patient s personality and satisfy deep seated needs well recognized by the homeopaths in the past. This treatment in itself will relieve the milder disorders Our second approach is by the interview which allows some expression of the patient s personal and interpersonal problems both in the present and in the past, preferably by means of the associative anamnesis type of interview This is fairly easily taught and is well covered in the literature *(6 8–10)* When psychiatric aid becomes imperative the initial consultation work should take place on the medical or surgical ward the psychiatrist appearing simply as another medical officer Emotional catharsis does not always have to be "deep" to be effective The value of situational changes in many cases is beyond question and should be recommended when necessary In the service a frequent cause of emotional difficulties is the square-peg in-the-round-hole situation This is due in part to the necessities of the military setup and our tendency to believe that psychologic plasticity is always directly related to chronologic age.

In addition to medical care, emotional catharsis and situational change the continued psychotherapy and ancillary treatment of patients with chronic psychosomatic disorders is important This should be planned according to the patient s needs preferably by his physician and a psychiatrist in combination with the head of the ancillary service In these patients, body conditioning should receive a high priority This is extreme important in the military service which encourages the development of compulsive obsessional and phallic aggressive character traits that are decried or denied by most persons in a normal civilian setup The encouragement of these character traits emotionally rigid persons and those prone to psychosomatic disorders tends to arouse certain anxieties from the past It is here that body conditioning takes on its significance Muscular activity is associated with the relief of anxiety and tension and has muscles erect posture and good physical condition are psychologically associated with ego intactness and strength and are a tremendous aid in warding off anxieties and fears of disintegration ("going to pieces") commonly found in psychosomatic conditions

As an offshoot of our awareness of the "abnormal" nature of the military setting, we might use only selected nursing personnel and stress ambulatory nursing care for the milder psychiatric

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(9) Murphy W F and Kligerman, S. Assistance in team psychotherapy Dis Nerv Syst 11 291 297 Oct 1950

(10) Deutsch F Applied Psychoanalysis Grune & Stratton, Inc New York, N Y 1949

patients in the combat zone, because extended bed rest and maternal nursing care tend to encourage a "giving in" and a regression to more dependent infantile character patterns The word "selected" is used advisedly because there are maternally oriented men as well as women The use of secondary gains is especially marked in patients with psychosomatic disease and this should be borne in mind in prescribing bed rest and nursing care

A major part of preventive psychiatry and a most important feature of treatment is morale building, which has largely been neglected by us Although educational, social, and Red Cross workers and occupational therapy aids are adjuncts to morale building, the most important morale factor is connected with the reason why the serviceman is fighting and for what. Morale building should not be confused with "entertainment," which is somewhat overrated and misunderstood This problem is intimately intertwined with that of leadership and is a subject beyond the scope of this paper

SUMMARY

Patients with mild psychosomatic disorders do not represent difficult psychiatric problems Insight therapy on a long-term basis is not feasible and should not be attempted by inexperienced personnel Treatment while in the military service should be prompt, symptomatic, and superficial Minor and moderately severe disorders can and should be treated on a medical service with or without psychiatric help The only patients who should be referred to a neuropsychiatric service for extended treatment are those whose psychosomatic disorder is severe, chronic, or secondary to a neurotic breakdown or psychosis In these patients, all adjunctive aids and activities should be used. In war when there is a shortage of doctors, the ancillary service personnel, including attendants, corpsmen, and nurses, should be trained to help the patients to discuss superficial emotional problems Such training should be given at a simple level Job classification and morale building are important both in the prevention and treatment of these disorders Most of these patients can function adequately in an environmental setup peculiar to their individual needs and will respond to simple measures

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A TECHNIC FOR MAKING TEMPORARY CROWNS, SPLINTS, AND BRIDGES

With Direct Resinous Filling Materials

DAVID J BARABAN *Captain, USAF (DC)* (1)

DIRECT resinous filling material can be used for making temporary crowns, splints, and bridges which are comfortable, functional, and esthetically acceptable to the patient The technic is a duplicating procedure whereby the desired teeth are reproduced in the plastic material A tem-



Figure 1 Lower left cuspid second premolar and second molar prior to preparation for full acrylic veneer crowns for bridge abutments

porary plastic crown can be made to duplicate the anatomy and shade of the natural tooth that is being prepared for full crown This technic is not original Its use can be varied according to the desire and ingenuity of the operator

The same procedure is used for one or more teeth (fig 1) The tooth to be prepared for full crown should be intact If it is

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Figur 2 Se tional impr s on with lg nat of b tme t t th

not its missing portions usually can be restored with gutta percha or other suitable material The first step prior to cutting the tooth is to take a sectional impression with alginate of the area which includes the tooth (fig 2) The impression should be checked carefully Material in the interproximal embrasures should be cut away to insure accurate reseating of the impression in the mouth The impression must be kept moist during the preparation of the tooth Talkov (2) has advised that it be placed in a humidifier rather than in water or a fixing solution so that it does



Figur 3 The abutm t t th have be pr pa ed for f ll acrylic veneer crowns

(2) T lkov L P onal mmunica on



Figure 4. Temporary plastic crowns in posit on.

not become stiff but retains the elasticity it had when with drawn from the mouth He suggested the use of a small, nearly airtight, plastic box in which moist cotton can produce the humidifying effect

When the preparation of the tooth is completed (fig 3), the impression is reseated in the mouth to determine the proper path of insertion The prepared tooth is lubricated with a thin coat of petrolatum Moisture is removed from the impression with com pressed air Sufficient plastic filling material of the chosen



F gure 5 Photograph shows lower cuspids prepa d for acrylic venee crowns as bridge abutments

with arterial occlusion is a waxy white *(8)* The normal pinkness or redness of the skin and mucous membranes is related to the amount of hemoglobin in the blood in the underlying capillaries or subpapillary venous plexus The red color results from the absorption of blue and green light by hemoglobin *(8)* Oxyhemoglobin and reduced hemoglobin have similar absorption spectra in the free transmission of visible red Reduced hemoglobin transmits more blue light and causes the blue hue of venous blood *(8 9)* Cyanosis is spectrophotometrically related to reflected light rather than to transmitted light. Cyanotic patients reflect more light of violet wave lengths and less of red and green wave lengths than do normal persons *(9)*

Cyanosis is usually generalized but may be localized and may vary from a barely perceptible blue to dark purple Changes in the capillary blood produce cyanosis as well as the pallor of anemia Icterus is caused by pigments which are present in the intervascular tissues as well as in the blood vessels and is observed in the relatively avascular sclera where cyanosis is not usually seen The cyanotic color disappears when the blood is pressed out of the skin but the icteric color does not *(10)*

The detection of cyanosis involves color appreciation on the part of the examiner Variations in appreciation exist among well trained observers and with the same observer at different times Studies with the oximeter have yielded surprising results *(7)* Unless cyanosis is marked and persistent, it may be unimportant *(5)* Cyanosis and anoxemia are not synonymous Anoxemia is more important and should be diagnosed by all available means *(7)*

The degree and shade of discoloration in cyanosis varies with the individual The following modifying factors are not capable of producing cyanosis but influence the amount of unsaturation necessary to produce a visible color change in the skin and to modify the color produced (1) the thickness of the avascular epidermis (2) the degree of pigmentation of the skin (sunburn tanning racial characteristics icterus Addison's disease argyria et cetera) (3) variations in color of the blood or plasma (pigments, lipids, leukocytes et cetera) (4) variations in the concentration of oxyhemoglobin in the blood (5) variations in number width length, and character of blood filled superficial vessels (6) variations in the extent to which superficial blood

(8) Burwell H B Basis of cyanosis a textual study J F Iliot P oc Staff Meet., Mayo Clin. 22 162 165 Apr 1947

(9) Shepard C. and Brown, G. E. The spectrophotometric analysis of color of human skin observations by the method in normal and in pulmonary disease subjects Arch Int Med. 38 816-831 Dec 1926

(10) Bauer J Differential Diagnosis J B Lippincott Company Philadelphia and Montreal New York, N Y 1950 pp. 445-449

approximates in unsaturation the arterial or the venous blood, and (7) variations in the light in which the skin is examined *(2)*

Hemoglobin, the coloring agent in the erythrocytes, forms a stable compound, methemoglobin, which is a true oxide Skin discoloration appears when over 3 grams of methemoglobin are present in each 100 cc of blood *(11)* Reduced hemoglobin when combined with hydrogen sulfide forms sulfhemoglobin which imparts to the blood a chocolate color The color of cyanosis depends on the absolute amount of reduced hemoglobin present in the blood and not on the relative amount of oxyhemoglobin and reduced hemoglobin *(12)* The following basic factors operate to produce cyanosis (1) the total content of hemoglobin in the blood, (2) the amount of hemoglobin deoxygenated in the passage of blood from arteries to veins, (3) the fraction of total hemoglobin passing in reduced form through pulmonary capillaries, and (4) the fraction of the total hemoglobin shunted through unaerated channels from the right side of the heart to the peripheral arteries *(2)* If abnormally high, each of these may produce cyanosis They usually occur in combination

About 10 grams of hemoglobin pass through the lungs per second and they carry a large amount of oxygen to the tissues Blood can transport about 60 times as much oxygen as plasma *(11)* Capillary blood must have 7 unsaturated volumes per 100 cc for cyanosis to exist and that corresponds to a definite degree of anoxemia Cyanosis may exist to a marked degree, as in polycythemia, without anoxemia, but, on the other hand, a patient may die of anoxemia without exhibiting cyanosis, as in severe anemia in which there are not 5 grams of hemoglobin available per 100 cc of blood to become unoxygenated *(13)*, in carbon monoxide poisoning, and in cyanide poisoning *(12)* In shock, peripheral vascular constriction may mask cyanosis (6) The level of CO_2 in the blood has no direct relationship to the production of cyanosis *(11)*, but there are instances in which anoxemia is accompanied by a decrease in CO_2 because of its elimination by hyperventilation Partial collapse of peripheral vessels, which depend in part for their normal state of dilatation on the presence of adequate CO_2, causes the overlying skin to become pallid The combination of pallor and cyanosis produces a distinctive gray color *(4 12)*

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(11) B t C. H d Taylor N B Th Physiol g cal Basi of Medic l Pr ct ce 5th ed ti Th W lliam & W lk Co B ltimo Md 1950

(12) Ma Bryd C. M Sign d Symptoms J B Lipp ncott Co Ph lad lphia P 1952 pp 280-286 676-677 690-691

(13) Sod ma W A. (dit) Path l g Phy i logy Mechanisms of Di a W B Saund rs Co Philad lphia P 1950

CLINICAL CONDITIONS ASSOCIATED WITH CYANOSIS

Cardiac disease Cyanosis has long been considered an important prognostic sign in heart disease It occurs in congenital defects that produce a venous arterial shunt and in mitral valvular disease associated with dyspnea It may also be a late symptom in congestive heart failure and in all kinds of advanced cardiac disease Cyanosis occurred in nearly half the patients with congenital heart disease in Abbott's series (14) It is greatly reduced in patients with the tetrology of Fallot by the Blalock Taussig operation or a similar procedure (10, 15) Cardiac catheterization and angiocardiography have confirmed earlier theories that patients with actual or potential venous arterial shunts exhibit the cyanotic color (16 17)

Pulmonary disease Pulmonary conditions are the most common causes of cyanosis Those who live at high altitude have chronic anoxemia and usually polycythemia which disappears on transfer to sea level Anoxemia at elevations of 10 000 feet is so severe that many persons become cyanotic on exertion At 17,000 feet, cyanosis is usually present even in persons at rest and may be accompanied by clubbing of digits, polycythemia cor pulmonale, and congestive failure With acclimatization anoxemia is corrected but cyanosis persists because of the polycythemia (12)

Ventilatory insufficiency and inadequate admixture of gases within the alveoli occurs in severe emphysema, causing anoxemia and cyanosis (18) Osler stated Cyanosis of an extreme grade is more common in emphysema than in other affections with the exception of congenital heart disease It is one of the few diseases in which a patient may be able to go about and walk into the hospital or consultation room with a lividity of startling intensity" (2)

Pulmonary and pleural fibrosis and pneumonconiosis, by limiting ventilatory effectiveness may cause anoxia and cyanosis as does excessive surgical removal or compression of lung tissue Primary pulmonary vascular sclerosis ("Ayerza's disease") and pulmonary arterial hypertension cause cyanosis Acute pulmonary diseases such as pneumonia, bronchiolitis, atelectasis and pulmonary embolism may be accompanied by a transient cyanosis

(14) Abbott M C g nital heart di I N ls Loose-Leaf M dic Thom N Y & So N w York, N Y 1937 pp 207 321

(15) T s g H B nd Blalock A Ob on l me f pulm nary ulat s nd its importa t product f ya i nd p ly yth mia Am Heart J 33 413-419 Ap 1947

(16) F dberg C K D f h Heart W B Sa d rs Co Ph ladelphia Pa 1949

(17) Sel r A Ch ac cy no s Am J M d 10 334 355 Ma 1951

(18) Baldw E d F C urna d A nd R ha ds D W J Pulmonary mech f ncy tudy of 122 ca f hronic pulmonary mphy ma M d in 28 201 5 M y 1949

Blood disease Cyanosis may result from primary polycythemia in the absence of anoxemia or may be accentuated by polycythemia secondary to anoxemia because the physiologic unsaturation of capillary blood in the presence of a high content of hemoglobin often reaches values above the threshold for visible cyanosis The arterial saturation in polycythemia vera is normal, although cyanosis may be present when the patient is at rest or only when he exerts himself The increased blood volume causes capillary dilatation with resultant stagnant cyanosis *(19)*

Cyanosis in the newborn is similar to cyanosis in the adult. The fetus in utero has a relatively insufficient oxygen supply that may be further impaired by drugs or obstetrical procedures Fetal blood has a compensatory increase in total hemoglobin concentration because its degree of oxygen unsaturation is equivalent to that of maternal venous blood McKhann *(20)* compared a physiologic cyanosis" of the fetus to the "physiologic jaundice" after birth

Cyanosis in anesthetized patients The occurrence of cyanosis in an anesthetized patient indicates anoxemia and signifies that the oxygen intake should be increased It is notably absent in open drop anesthesia but occurs not infrequently in closed system anesthesia *(2)*

Miscellaneous Local cyanosis is encountered in areas where venous drainage is impaired Severe cyanosis of the face may develop if the superior vena cava is compressed by a mediastinal tumor or aortic aneurysm If an aortic aneurysm perforates into the superior vena cava, a typical syndrome, characterized by sudden cyanosis and edema of the face and a bruit over the shunt rapidly appears *(10)*

Acrocyanosis constitutes a uniform and relatively permanent discoloration of cold and moist hands and feet, seen frequently in patients with autonomic nervous imbalance *(10)* that may be caused by venous spasm with atony of the capillaries *(21)* If blue or purple mottling extends to the proximal parts of the extremities, livedo reticularis is present and exposure to cold intensifies the discoloration

Methemoglobinemia may cause a discoloration of the skin and mucous membranes which resembles cyanosis, but it is blue gray or blue brown rather than blue purple The diagnosis is made by

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(19) M ly G R nd Kaltr d N L. Study f v lume of blood in c ng st h art fa lur I t t the mea ur m nt in 15 pati t J Clin In stig t n 22 521 530 July 1943

(20) McKha C F Cy t f wbo n. J Michigan M Soc 40 455-458 Jun 1941

(21) Wright I S. V ul D in Clinical Pra tice Th Y r B ok P bl h r I — Ch go Ill. 1948

spectroscopic examination of the blood (°°) Some investigators have stated that the compound formed by sulfonamides and hemoglobin is distinct from methemoglobin and sulfhemoglobin (13 °3) Methemoglobinemia may occur in infants receiving formula made with well water containing nitrates that are converted by intestinal flora to nitrites which are absorbed and oxidize hemoglobin Methemoglobin may be present in normal blood in amounts up to 0 1 gram per 100 cc (24) A rare, familial type of methemoglobinemia can be recognized by the exclusion of the extrinsic etiologic factors and by its duration and occurrence in several members of a family (24)

Clubbing of the fingers is frequently associated with cyanosis but there is probably no direct causal relationship (°5) though both are manifestations of the same pathologic process In the differential diagnosis of diseases producing cyanosis it is helpful to know whether clubbing and secondary polycythemia are present (25)

TREATMENT

The treatment of cyanosis is the treatment of the underlying cause It directs attention to anoxemia and the need for oxygen Certain tissues are more susceptible to anoxia than others The arms and legs may be deprived of oxygen for 1¼ hours by arterial occlusion and still recover normal function (°6) Permanent brain damage or even death may follow asphyxia for a period of from 5 to 10 minutes (°6) The heart and adrenal glands also are particularly sensitive to severe anoxia

When cyanosis is caused by the admixture of venous and arterial blood or tissue anoxia little benefit can be expected even from the administration of 100 percent oxygen because the blood leaving the lungs is already 95 percent saturated The oxygen dissociation curve illustrates that only an insignificant rise in oxygen content can be obtained under these circumstances and this is due to an increase in the amount of oxygen in solution in the plasma When inadequate oxygenation of pulmonary blood is the cause of cyanosis oxygen therapy is usually beneficial In pneumonia oxygen helps to overcome the anoxemia caused by shallow and inefficient breathing associated with pain

(22) R C. F E g us cy is J Roy Army M Corps 88 123 127 Mar 1947

(23) Kallin S. The cyanos d l p ng dur ng treatme t w h U lamid p r ar u us Act med ica d m 130 1 110 Mar 1942

(24) B ltzan, D M nd Sagarman, H H ednary cya osi Canad M. A. J 6 348-350 Ap 1950

(25) M ndlow tz M Cl bb g nd hypertrophic t oarthr pathy M d ine 21 269-306 Sep 1942.

(26) Barn b A L Phy l g Ther py R p ratory Di 2d d a. J B L ppinc tt Co Ph lad lphia P 1948

and alveolar exudate *(12)* In pulmonary edema a vicious cycle may occur with edema producing anoxemia, which in turn produces more edema This may be overcome by the administration of oxygen *(12)*

SUMMARY

Cyanosis is caused by the presence in the capillary blood of an amount of unoxygenated hemoglobin in excess of the threshold value It may be produced by many pathologic conditions associated with anoxemia or increased hemoglobin content of the blood It is not a reliable index of the degree of anoxemia The degree of oxygen saturation of the blood should be measured directly if it is of importance to treatment.

BOOK REVIEWS

Gynecology Diseases and Minor Surgery compiled and edited by *Robert J Lowrie* M A M D F A C S. D-OG Associate Clinical Professor of Obstetrics and Gynecology College of Medicine New York University Attending Gynecologist and Obstetrician St Vincent s Hospital Attending Obstetrician City Hospital Welfare Island Attending Gynecologist Willard Parker Hospital Formerly Chairman Section on Obstetrics and Gynecology New York Academy of Medicine New York N Y Consultant in Gynecology and Obstetric Passaic General Hospital Passaic N J Fellow of the New York Academy of Medicine Fellow of the American Public Health Association Foreword by *Claude E. Heaton*, M D 806 pages illustrated Charles C Thomas Publisher Springfield Ill 1952 Price $22 50.

Great interest will naturally be directed toward any well organized, comprehensive and current textbook dealing with gynecology because many women remain under the management of the general practitioner Major surgical procedures which are required by only a small proportion of gynecologic patients have prudently been omitted The emphasis has properly been given to diagnosis treatment minor surgery and female endocrinology The editor who is also a contributor has devoted the text strictly to the field of gynecology and expects the reader to consult other sources for information regarding the disorders often encountered in allied fields such as female urology and general surgery Considering the large number of other contributors a remarkably uniform plan of presentation without contradiction and repetition has been maintained The initial outline in detail of each chapter increases the availability of material throughout the text and the double-column page facilitates reading Illustrations have generally been very well selected The bibliography is not exhaustive but is representative and adequate

The initial chapters devoted to anatomy excel in the presentation of the confusing musculofascial structures and are otherwise adequate except for the short chapter on the vascular system The drawings are confusing too diagrammatic and depict some inaccurate relationships The chapter on diagnosis is well illustrated The author however fails to clarify particularly for the energetic but uncertain student and less experienced physician a systematic and thorough method for the proper performance of clinical gynecologic examination Several subsequent chapters such as those devoted to the normal menstrual cycle carcinoma of the cervix puerperal infections ovarian tumors infertility and minor surgery are especially good The chapter on physical therapy in gynecology should prove helpful to many clinicians because crowded medical curricula and graduate training have not usually permitted sufficient attention to this type of treatment The section on medications commonly used in gynecology is informative but any coverage of this subject must be incomplete and becomes obsolete in a discouragingly short time This book deserves to become a standard textbook

—*Comdr E B Hopper MC USN*

Clinical Endocrinology Volume I and II by *Lewis M Hamilton M D* F A C P Head of the Department of Internal Medicine Lahey Clinic Boston Physician New England Deaconess Hospital Boston and National Naval Medical Center Bethesda Staff of Cooper Hospital Camden N J Volume I 749 pages Volume II 850 pages 482 figures 146 charts 1 color plate J B Lippincott Co Philadelphia Pa publishers 1953

This new book is planned to provide source material in outline form " It covers the endocrine glands and such related subjects as sterility, obesity, metabolism and steroid compounds The outline followed generally consists of a division into preclinical and clinical phases with consideration given to normal decreased and increased functional states of each gland The chapters on the pituitary, thyroid ovary testis, and pancreas are especially good The chapter on the adrenals is surprisingly brief and the consideration of the cortex and medulla of the adrenals in the same chapter is at times confusing The photographs and charts are good More than 9 000 references are listed and there is a good index This book fulfills the purpose for which it was designed namely a practical reference on endocrinology but it does not replace the usual narrative text

—*Lt Col S H Sandifer MC USA*

PAIN EQUIVALENTS TREATED WITH ELECTROSHOCK

LESLIE B HOHMAN *M. D* (1)

WILLIAM E WILKINSON *Colonel MC USA* (2)

THE senior author of this communication has long believed that many of the so-called psychoneuroses should be classified as affective disorders Although the chief presenting symptoms may be physical complaints or neurotic functional manifestations (hypochondriacal, neurasthenoid, anxiety, hysterical, or obsessive-compulsive symptoms), a more complete examination reveals that the essential findings of an affective disorder are present This would lead to the conclusion that the presenting symptoms are to be understood as only one part of a clinical picture which should be sharply differentiated from the general group of psychoneuroses in which the presenting symptomatology is the whole of the clinical picture

We can expect that if this proposed differentiation is correct the course and outcome of this group of patients i e those having an affective disorder with psychoneurotic presenting symptoms, would be that of other affective disorders that their disease would be self limited with relief of all symptoms when the affective disorder had run its course

This thesis can be tested by the therapeutic use of electroshock which has the ability temporarily or permanently to abolish pathologic pervasive affectivity We emphasize the temporary character of the abolition of pathologic affectivity because relapse is often a disappointing result

A test of this hypothesis was made on 50 patients in a 3 year study The need for therapy in a group of patients on the neurosurgical service presenting symptoms which suggested neurosurgical disease was urgent and psychiatric help was requested

The problem was set up in the beginning with the following provisions

1 We would be willing to treat patients in whom the presenting symptom was pain (severe head, back facial thoracic,

(1) Professor of Psychiatry Duke University School of Medicine Durham N C.
(2) Professor of Military Science and Tactics Duke University School of Medicine Durham, N C

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This thesis can be tested by the therapeutic use of electroshock which has the ability temporarily or permanently to abolish pathologic pervasive affectivity We emphasize the temporary character of the abolition of pathologic affectivity because relapse is often a disappointing result

A test of this hypothesis was made on 60 patients in a 3 year study The need for therapy in a group of patients on the neurosurgical service presenting symptoms which suggested neurosurgical disease was urgent and psychiatric help was requested

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or abdominal pain) for which no adequate explanation could be found

2 We stated that the method could be expected to yield successful results only if the evidence for disturbed pathologic affectivity was apparent

3 We would not refuse to treat patients with psychoneurotic pain but would anticipate poor results

Later we added a further aim to our protocol—namely to use electroshock as a diagnostic method in certain patients before a radical operation was undertaken

The urgent need for active therapy in this group of patients was pointed up by the fact that severe pain often leads to the use of addicting drugs When this occurs recovery from the affective disorder leaves the patient with another condition more serious than the original Furthermore prolonged treatment for possible physical disease by neurosurgical procedures often superimposes an iatrogenic psychoneurosis

Of the 50 patients reported here, 32 were successfully treated By successful treatment we mean complete recovery or recovery to such a degree that all drugs were discontinued and the patient was able to return to work Of these, 30 were diagnosed as circumscribed depressions and recovery was regarded as probable before treatment Of the 32 patients 18 were taking morphine codeine or demerol in addicting doses and 3 others were taking large doses of barbiturates There was complete cure without in 19 In 11 there was a slight relapse but in 5 of these a second course of shock therapy resulted in complete recovery The other patients refused adequate treatment In our experience pain stops after from 2 to 4 treatments and some patients refuse to continue the treatment A few have refused further treatment because of the apprehension accompanying a shock treatment

CASE SUMMARIES

The types of patient treated are summarized as regards their presenting symptoms a patient with (1) low back pain radiating to the legs and no relief following removal of a herniated nucleus pulposus and spinal fusion (2) recurrent low back pain of 8 years duration and no relief following removal of a herniated nucleus pulposus (3) posttraumatic low back pain of 2 years duration and no relief following removal of a herniated nucleus pulposus (4) posttraumatic low back pain radiating to leg and jerking of left arm of 18 months duration (5) pain in lower spine tinnitus and drawing sensation in the ears of 3 years duration (6) pain in lower spine and right groin and leg of 3 years duration (no herniation of nucleus pulposus found on operation)

(7) low back and right leg pain of 18 months' duration with no relief following spinal fusion, (8) low back pain and pain in lower extremities of 8 years duration (patient had had operations for removal of herniated nucleus pulposus), (9) low back pain and right leg pain of 2 years' duration (following childbirth) (10) recurrent low back pain and cramping in left leg of 12 years' duration, (11) low back pain of 9 years' duration and no relief following removal of herniated nucleus pulposus and spinal fusion, (12) low back pain, pain in neck, pain in both eyes, and headaches of 18 months' duration, following trauma, (13) post-traumatic pain in foot of 18 months' duration, (14) pain in right hip, (15) trigeminal neuralgia of 7 years' duration with no relief following 3 alcohol injections (16) pain on right side of the face of 3½ years' duration with no relief following alcohol injection or partial sympathectomy, (17) recurrent headaches accompanied by severe nausea and vomiting of 3 years' duration, (18) severe headaches of 10 months' duration, (19) recurrent abdominal pain of 8 years' duration (patient had 8 hospital admissions with 2 abdominal explorations, including a subtotal gastric resection), (20) abdominal pain, low back pain, and flank pain (hydronephrosis) of 4 years' duration and many surgical operations, and (21) pain in left shoulder and arm of 1 year's duration with recovery following psychotherapy and treatment with dexamyl

Of the 18 patients in whom treatment was unsuccessful, 10 were diagnosed as psychoneurotic before treatment and were not regarded as having affective circumscribed disorders 4 of the remainder were regarded as having psychopathic personalities Seven of the 18 had superimposed depressive episodes These improved, but relapse occurred in all but 1 and 4 were thought to have circumscribed depressions One had a severe fungus infection of the spine with severe pain and morphine addiction After 6 treatments, he became paranoid and treatment was discontinued Later a lobotomy was performed At first, the results were disastrous but at the end of a year the patient was able to return to work Another patient, a man of 75 years, developed acute urinary retention after one treatment and had to have a prostatectomy A third patient had periodic attacks of right sided facial pain She obtained marked relief but not complete recovery Her symptoms suggested organic factors The fourth had bilateral frontal headaches and pain in both ears and on the left side of the face He improved markedly but relapsed

The use of electroshock may be an important diagnostic aid A 45 year old man developed a severe pain in the right lower extremity which could be controlled only by large doses of morphine He was unable to continue work and the cost of morphine obtained illegally because physicians, suspecting that he was a drug addict were unwilling to continue to prescribe the

drug became prohibitive The neurosurgeons were unwilling to accept the diagnosis of drug addiction without more intensive search for the cause and treatment of the pain It was decided to give the patient a diagnostic trial of electroshock therapy We were confident that at the end of 4 or 5 treatments psychogenically determined pain would be markedly alleviated if not totally relieved, even if it later recurred This man obtained no relief A chordotomy was performed and his pain was immediately relieved no further drugs were required and the patient was able to return to his work promptly

DISCUSSION

The recognition of self limited affective states in outpatients especially those whose symptoms led them to consult an internist or surgeon for the relief of physical complaints is probably difficult because the concept of affective psychoses or manic depressive disorders is derived from hospitalized patients with severe mental disorders Many psychiatrists believe that the severe manic-depressive psychoses are of a different order than the milder noninsane affective disorders seen in outpatients The psychiatrist has been unwilling to see that outpatients with these affective disorders are akin to hospitalized patients with severe mental disorders All the special categories of reactive simple, psychoneurotic and neurotic depressions constitute an attempt—which seems to us faulty—to separate severe and less severe cases and regard them as differing qualitatively instead of only quantitatively

The response of patients to electroshock is strong confirmatory evidence of our point of view Furthermore careful history taking will reveal that many episodes of mild depression are preceded or followed by definite elative periods There is often a history of repeated previous attacks of depression and elation These are frequently masked because they are put down to prolonged convalescence following operations often unnecessary or childbirth

SUMMARY

Fifty patients with severe pain often requiring addicting doses of morphine demerol, or codeine were treated with electroshock In 32 recovery was predicted as probable because they were regarded as having circumscribed affective disorders from which they should spontaneously recover if they were not converted into drug addicts or iatrogenic neurotics The improvement and recovery rate in these patients justified our assumption that pain can be an equivalent of a psychic symptom in affective disorders

The 18 patients who were not benefited by electroshock therapy had psychoneurotic illnesses or psychopathic personality disorders In 4 of the patients who were thought to have depression, treatment resulted in complications which necessitated cessation of therapy, recovery was not complete, or a complicating organic factor was present

The results in this series are encouraging and would seem to prove that pain, when it is an accompaniment or equivalent in affective disorders, will be benefited by electroshock therapy or will stop spontaneously if given time A therapeutic test trial of electroshock therapy is a valuable diagnostic procedure for deciding whether or not to perform a prefrontal lobotomy or chordotomy for the relief of intractable pain

BOOK REVIEWS

Office Management of Ocular Diseases by *William F Hu b* Professor and Head Department of Ophthalmology Un y t l nois College of Medicine Ophthalmologist in Chief Illi o E Ear Infirmary and Attending Ophthalmologist Presbyterian Hospitals Chicago 452 pages illustrated The Year Book Publishers Inc Chicago Ill publishers 1953 Price $9

Although this small but excellent book presents little material which is startling or new, it is concise, well written and describes practical and tried methods Valuable up-to-date aids in diagnosis and therapy which have been gathered from many sources are herein consolidated In the outline of recommended treatments the author may seem slightly dogmatic but such action seems justified by the size of the book Indications for some major surgical procedures are discussed, but only a few minor procedures are covered in detail Several of the photographic illustrations seem indistinct, especially those of the fundus The chapter on radiation therapy is excellent and covers in detail the indications, the methods of application, the dosage, and the expected results of beta radiation, grenz rays, x rays, and gamma rays The final chapter is an up to-date ophthalmic formulary This is not an exhaustive reference book but will be a valuable aid for the physician who treats an occasional eye patient, and for the student, or the ophthalmologist who desires a small volume which provides current opinion on important and common eye diseases —*Maj W W Mckinney MC USA*

Psychiatric T eatme t Proce d gs of th A soci t on Dec mber 14 and 15 1951 N w York N Y W th 49 illustrat ons d 62 table R e ch Publicat ns *As ociat for R e h Nerv us and M t l Dise* World Li t Abb e i t o s Re Publ A nerv me t Di Volume XXXI Edito ial Committ e *S B rna d Wortis* M D Chairma *Mor i H rma* M D and *Cl e c C H e* M D 451 page illustrat d The Williams d W lki Co B ltim e Md publi h rs 1953 P ce $9

This collection of papers covers various aspects of evaluation of therapy and types of therapy A most important and valuable technic of presentation is a summary which follows each group of 4 or 5 related papers, and the well-edited discussion of the topics In the field of individual and group psychotherapy, 17 papers are presented from such workers as Alexander, Rogers, Ruesch Lidz, and Frank In biologic, electric and pharmacologic treatments the area is reviewed and evaluated by Hughes Kalinowsky, Hoch Meduna, and others The third and final area is that of neurosurgical treatments with papers from 6 groups of investigators in this field This symposium brought together workers who were especially interested in evaluating the effec tiveness of different treatment methods It was hoped that a critical evaluation of the effectiveness of treatment methods would be achieved In fact the title of this book is somewhat misleading Critical Evaluation of Psychiatric Treatment would be more correct Although many sections are disappointing as far as reaching this critical evaluative goal, the collection of papers and discussions is well worth while as an addition to any psychiatrist s library —*Comdr S V Thompson MC USN*

Th Anatomy of the N rvous Syst m It De l pm t d F ct on by *St pb W It r Rans* M D Ph D Lat P of a o f N urol gy nd Director of N ur l g I Inst t t Northw t U sity Med cal School Ch go Rev ed by *Sam L lla d Cl k* M D Ph D P fe r of A tomy V d rbilt U i ty School of M d e N sh ll 9th d t o 581 pag ll trat d W B Sa nder C Ph la d lph P publ he 1953

The present revision of this well known standard textbook of neuroanatomy is superb Many portions of the text have been re written skillfully blending the more pertinent newer developments into the book without changing its organization or making it unduly long Excellent new illustrations have been added This book not only presents descriptive gross and microscopic neuroanatomy but also correlates structure with function This enhances the usefulness of the book tremendously It is highly recommended to medical students and clinicians as well as to neuroanatomists The bibliography is excellent and up to date

—*Lt Col J W Sumner MC USA*

LOCAL CHEMOTHERAPY OF SURGICAL WOUNDS[1]

PHILIP W FENNEY M D

JOSEPH M MILLER M D (2)

A PROGRESSIVE decline in the incidence of surgical wound infections has occurred because of the improvement in surgical technic and the systemic use of the antibacterial agents A further decrease in the incidence of infection in operative wounds which are unavoidably contaminated with bacteria might be achieved by the local implantation of broad spectrum antibacterial agents before closure The sulfonamides have been used locally in contaminated surgical wounds and in wounds due to external violence to reduce the incidence of wound infection. Their use was attended by an inflammatory reaction, a delay in healing, and a collection of serum postoperatively in the sutured wound In addition, the sulfonamides used were neutralized by para aminobenzoic acid, which is commonly already present in such wounds The original enthusiasm for their local use was not warranted (3 4)

Marfanil (4 amino-methylbenzene sulfonamide hydrochloride) is a highly soluble white crystalline powder which is bactericidal in vitro for a large number of aerobic and anaerobic bacteria It is active in the presence of blood and pus and is relatively nontoxic to tissues Its bactericidal activity is rapid (5) and is best at a pH of 7 8 but lessens with the acidity until complete inactivation occurs at a pH of 2 A 1 percent solution is bactericidal in vitro to the anerobes *Clostridium perfringens*, *Clostridium septicum* *Clostridium botulinum* *Clostridium fusiformi* (Clos

(1) Revi wed i the V t rans Administration and published with the approval of the Chief Med cal Dir ctor Th tateme t nd conclu ions published by the auth re are th r sult f th ir own study nd do not nece sarily reflect the opinion of the V terans Admi i trat n.

(2) Surg cal Servic V t r ns Administr tion Iowa Hospital Ml

(3) Meleney F L and Whipple A O Experimental study of the value of treatment of infection in oft part wounds compound fractures and human war wounds by the intramuscular use of sulf namid Surg Gyn & Ob t 80: 203 206 May 1945

(4) P ch J L Maun M E P lling M A and Illingsworth J W Effects of sulfanilamide nd sulf thiaz l o human ti ue Brit J Exper & Ol t pol 141 147, Feb 1945

(5) How E L L cal h m th r py of wounds II I I ability of certain sulfonamide bact rial ub tan s Surg Cyn & Ob t 81: 1 14, July 1945

tridium histolyticum Clostridium tetani and *Clostridium novyi (6)* Marfanil has minimum bactericidal action on *Proteus vulgaris Aerobacter aerogenes Pseudomonas aeruginosa* and *Klebsiell pneumoniae*

Howes *(5)* reported that a solution of 5 percent marfanil with 200 units of streptomycin per cc of water was valuable locally in the sutured wound In rabbits, this mixture was not irritating because it did not produce hyperemia of the eye, adhesions in the peritoneal cavity or leukocytosis or fibrosis of the muscle Contaminated surgical wounds washed with the mixture prior to suturing healed well *(5 7 8)* Howe *(9)* after testing the sensitivity of 50 strains of organisms isolated from surgical wound infections against penicillin streptomycin marfanil bacitracin and urethane stated that marfanil was the most effective topical agent To be nontoxic to living tissue cells the drugs must be used in a low concentration Their use in combination for local chemotherapy heretofore reported has been in a liquid menstruum *(5 7 8)*

The 2 drugs are mixed with powdered sterile gelatin which has the advantage of slow dissolution and absorption in the wound *(10 11)* The drugs have longer contact with contaminating bacteria and produce a better inhibiting effect Gelatin is non irritating nonantigenic completely absorbable has a mild hemostatic effect and does not interfere with wound healing *(12)* Sinclair and Douglas *(13)* reported that coating wounds in animals with gelatin powder resulted in a 33 percent increase in the firmness of the healing after 5 days and that the wounds healed with less reaction and with a finer scar than wounds in the control animals

We have used a mixture of 0 05 gram of marfanil *(14)* and 200 of streptomycin per gram of finely powdered sterile gela This mixture has remained stable and potent at room

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(If benz m hydrochlorid) W thr p-S ns Inc New York

(7) H P t f w und nf ct by f i bac erial A Surg 124 269-276 A g 1946

(8) K f A b p da Me k Report 61 3-8 Apr 1952

(9) How C W d ns p bil ty f ba t n t i us tub t ri w th rma l rube dil nd f l paper d m thod f t Gyne & Ob 91 66 672 De 1950

(10) Kaba H nd F dma A M. Eff f lowly b orbed p pe me l bock P oc Soc E pe B l & M d 46 385-387 Ma 1941

(11) Kalm M Cl l mp f p phr i l nd pinep t Allergy 12 55-60 Nov 1940

(12) Cor H J T J W E C Ce ta pr pe f ew phys orbabl po g P oc Soc E pe B l & Med 5 233-235 Ma 1945

(13) Sinclair J A J Jo gl B Loc l pla f g la l Surg 49 47 0 July 1944

(14) Th ma f l (alf l) l d by W h p-S ns I

(15) The g la wa K Gela Comp y

temperature for over 2 years and does not support the growth of molds. In aqueous solution it has a pH of 7. The bactericidal action of marfanil and streptomycin, separately and in combination, was tested in vitro by the filter paper disk technic using 45 strains of bacteria from infected surgical wounds (table 1). These bacteria were tested against varying concentrations of the drugs, using the area of inhibition as a criterion. The optimal concentrations were 0.05 gram of marfanil and 200 units of streptomycin per cc. of water. Little or no increase in inhibition was produced by greater amounts of the drugs. Although some of the bacterial strains tested were not sensitive to the individual drugs, all were inhibited by the combination.

TABLE 1. *Area of inhibition in vitro, of 45 strains of bacteria*

Bacteria	Number of strains	Area of inhibition after 24 hours (mm.)		
		With 5% marfanil	With 200 units of streptomycin per cc.	Combination of the 2 drugs
M. pyogenes var. *aureus* (coagulase positive)	8	2–6	0–3	2–5
Str. hemolyticus	6	10–13	0–12	8–12
St. viridans	3	5–12	6–9	8–12
St. faecalis	2	1–2	2–3	2–3
E. coli	6	0–3	3–5	2–6
Pneumococcus	5	5–10	2–5	7–9
K. pneumoniae	3	1–2	0–6	2–4
Ps. aeruginosa	4	2–3	0–5	2–5
A. aerogenes	3	0–1	5–7	5–6
P. vulgaris	5	4–6	2–7	2–3

Para-amino benzoic acid (1:5,000) was added to the culture medium in this part of the study. Significant changes in the areas of inhibition did not occur in 48 hours.

Fifty milligrams of marfanil and 200 units of streptomycin dissolved in 1 cc. of a 20 percent aqueous solution of gelatin did not cause hyperemia of the rabbit's conjunctiva, but increases in the amounts of the drugs caused hyperemia of the conjunctiva and clouding of the cornea. Neither gross nor microscopic evidence of peritoneal adhesions or irritation was present 1 month after 20 cc. of this solution were injected into the peritoneal cavity of guinea pigs and rabbits.

Encouraging results were obtained when surgical wounds following operations for acute gangrenous appendicitis and dis-

eases of the large bowel were dusted with the mixture of marfanil and streptomycin in powdered gelatin After the peritoneum was sutured the wound was dusted with the drug mixture and closed without drainage Seven wound infections occurred in 109 patients when this adjuvant therapy was used, as compared with 19 infections in 139 patients when it was not used (table 9)

Block excision of noninflammatory pilonidal cysts has been performed in 48 patients followed by dusting the wound with the described mixture primary closure and the postoperative systemic administration of penicillin and streptomycin for 6 days Three patients had poor results, one due to a wound infection In 71 control patients this local therapy was not used and 7 had poor results 5 of them due to wound infection (table 2)

TABLE 2 *Comparison of wounds treated with Local Antibiotic Mixture*

Type of operative wound	Therapy	Number of patients	Number infected	Per cent infected
Acute gangrenous appendicitis	Local dynamic	60	4	6 7
	Systemic	87	11	12 7
Large bowel disease	Local dynamic	42	3	7 1
	Systemic	52	8	15 4
Pilonidal cyst or sinus with primary closure	Local dynamic	48	1	2 1
	Systemic	71	5	7 0

All wounds in which the local therapy was used and no infection developed healed firmly in about 10 days with a soft, white scar and without any inflammatory reaction or collection of serum in the wounds *Proteus vulgaris Escherichia coli* and *Micrococcus pyogenes* var *aureus* were isolated from the wounds of patients with poor results All recovered bacteria were still inhibited in vitro by the mixture as shown by the filter paper disk method of testing

Hunter *(16)* described the ideal antiseptic as one having high germicidal or inhibitory properties, no tissue toxicity or at most a low toxicity, freedom from specificity, efficiency in the presence of organic matter power to penetrate stability and perhaps other characteristics including low cost The suggested mixture

(16) Hunter A. C. Evaluation of antiseptics J A M A 121 25-27 Jan. 2 1943

of marfanil and streptomycin in gelatin powder approaches these criteria Toxic or allergic reactions, either locally or systemically, have not been observed A higher concentration of these bactericidal agents will be achieved locally by the use of the recommended mixture than is possible by systemic therapy Local chemotherapy is not advised as a substitute for proper surgery or systemic antibiotic therapy, but only as an adjuvant in contaminated surgical wounds

SUMMARY

The combination of marfanil and streptomycin is bacteriostatic or bactericidal to a large number of aerobic and anerobic bacteria Resistance to the combination was not found in vitro in 45 strains of bacteria from infected surgical wounds Marfanil and streptomycin in sterile gelatin powder were dusted on contaminated surgical wounds, as an adjuvant to proper surgery and systemic chemotherapy, after operations for acute gangrenous appendicitis, large bowel disease and pilonidal cyst There was a marked reduction in the incident of wound infections as compared with the controls in which this adjuvant therapy was not used The mixture did not produce an inflammatory reaction, a collection of serum, or delay healing in wounds The mixture has remained stable and potent for over 2 years at room temperature and does not support the growth of molds

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BOOK REVIEWS

History of Anesthesia With Emphasis on the Nurse Specialist by *Virginia S Thatcher* Editor American Association of Nurse Anesthetist Publications 289 pages illustrated J B Lippincott Co publishers Philadelphia Pa 1953

The title of this book is misleading It should be titled History of the Nurse Anesthetist" It contains much rationalization of the nurse anesthetist's position, which is one of a technician, trying to place the nurse anesthetist in a professional medical realm Much space is given to the premise that the art of anesthesia belongs to women Such material is extremely controversial and has no place in a history book The author projects much of her own feelings into the book and this tends to irritate the reader In the chapter on "Research Goals" it is difficult to imagine a nurse anesthetist organizing a research project involving the oximeter, the electroencephalograph, the electrocardiograph, and the acoustic gas analyzer

The book describes the historical events of anesthesia in a cursory manner The bibliography is meager The history of anesthesia has been better described in other books The book does describe adequately the American Association of Nurse Anesthetists but does not describe the role of nurses in anesthesia in Europe The development of nurse anesthetists is of some historical interest It is stressed that the nurse has filled in a large gap in medicine when there was no physician available The book will have limited interest to the medical profession as a whole —*Comdr S Whitehouse MC USN*

A Short Practice of Surgery by *Hamilton Bailey* F R C S (Eng) F A C S F I C S F R S E Emeritus Surgeon Royal Northern Hospital London Senior Surgeon St Vincent Clinic and the Italian Hospital Formerly External Examiner in Surgery University of Bristol and *R J McNeill Love* M S (Lond) F R C S (Eng) F A C S F I C S Surgeon Royal I N the Mildmay Mission and Metropolitan Hospitals Consulting Surgeon City of London Maternity Hospital Consulting Surgeon Postal Branch Hospital Associate for General Surgery West End Hospital for Nervous Diseases Member of Council and Court of Examiners Examiner Widely Demonstrator and Professor Royal College of Surgeons With Pathological Illustrations by L C D Harnett M B Ch B (Edin) Pathologist Royal Infirmary Sheffield 9th edition 1 254 pages 1 234 illustrations of which 272 are colored The Williams & Wilkins Co Baltimore Md publishers 1953 Price $12 50

In this book the authors have produced a well written and easy to-read survey of general surgery The frequent references to individuals and their contributions to medicine and surgery make it interesting, particularly from a historical viewpoint Only such material generally acceptable and up to date is included There are many illustrations each of which emphasizes a particular diagnostic point or demonstrates certain pathologic features Some seem a little archaic and have been observed in older textbooks This edition includes a glossary of anatomic names The large number of surgical diseases discussed in this textbook allows only a brief but accurate description of the disease its diagnosis, clinical course and an approved treatment but not detailed surgical technic Statistics are adequate for the maintenance of interest The appreciation of clinical signs and symptoms and the valuable assets of visual aid are emphasized Although the book is neither intended, nor is it suitable as a reference for the surgical specialist it is particularly recommended for undergraduates and will stimulate them to further reading in more advanced literature

—*Col H T Berwald MC USA*

at the motor end plate thus differing from d tubocurarine which interferes with the activity of acetylcholine Its respiratory effects are transient when compared with curare and its derivatives On the intravenous administration of decamethonium muscular relaxation and respiratory depression which occur rather suddenly, begin within a minute The respirations return to normal within from 3 to 5 minutes *(4)* Return of muscular function has its onset a few minutes later and is complete within from 20 to 30 minutes Prolonged apnea has been encountered following large doses of decamethonium *(5)* Anticholinesterases are of no value in overcoming the blocking effect of this muscle relaxant In the presence of respiratory depression supportive treatment by adequate ventilation with oxygen is indicated Because of its short action the effects of this drug are controllable Apnea has been observed following small doses

In the presence of thorough oxygenation alterations in the circulation are of little significance, even after large doses of the drug The pulse rate and blood pressure show no appreciable changes and ECG s reveal no abnormalities that are attributable to the agent

After respiration has returned to normal abdominal muscular relaxation may continue for as long as 30 minutes the degree of relaxation being directly related to the size of the dose Transient muscular fasciculations, especially over the chest and abdomen have been noted immediately after rapid intravenous administration of decamethonium and before any prominent degree of paralysis had developed These spontaneous movements are attributed to an initial direct stimulating effect of the drug Decamethonium does not enhance the action of any of the commonly employed anesthetic agents and the effect of a given dose is constant Ethyl ether does not augment its action Repeated doses do not appear to have an accumulative effect and there is no habituation or increase of tolerance to the drug Therefore the results from a definite amount of decamethonium are predictable and when repeated will produce identical effects in a given patient

The action of decamethonium was not accompanied by histamine like effects or block at autonomic ganglia *(6)* and no serious untoward results have b en described Bronchospasm and significant hypotension have not been observed with this agent It has

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(4) Spenc C. H nd Coakley C. S Clin l mpt as f d cameth um bromid (C10) in h p l mi ary port. M. Ann D tr t of Col mbia 19 13 135 177 Mar 1950

(5) Ha L C J nd Dr pps R D U e f d cameth um br mid for produ ct f mus la laxa on. An th l gy 11 215-223 Ma 1950

(6) Gr b D H laday D A nd Harv y A M. Eff cts f b -tr me byla moniu d d odid nd d br mid ur mus lar f t on nd nd d convulsions man. N w E gland J Med 241 812 815 N 24 1949

been deliberately employed in patients with bronchial asthma without ill effect *(7)* It is freely miscible and compatible in any proportion with thiopental sodium solution, which is a convenience in preparing a patient for endotracheal intubation Following the injection of decamethonium in the unanesthetized patient, there is no alteration in the state of consciousness Anesthesia or analgesia is not produced The drug has been helpful in the administration of anesthesia in geriatric and pediatric patients because physiologic functions are little disturbed and the operative and recovery periods are generally uneventful

ENDOTRACHEAL INTUBATION

The aim of the technic to be described is to achieve a smooth, atraumatic intubation of the trachea In most instances, the untoward effects of this procedure may be attributed to imperfect or improper preparation of the patient for intubation The adequate preparation of the patient is more important than the actual intubation *(8)* In this connection, decamethonium has been found to be satisfactory and has several advantages over curare and the related drugs It produces a well relaxed musculature and reasonably consistent results can be predicted It does not precipitate bronchial or laryngeal spasm and contributes to the relief of existing spasm This prevents or minimizes trauma to the larynx and trachea during intubation Decamethonium generally sustains the vocal cords in marked abduction and relaxation so that there is little or none of the straining and "bucking" that so frequently accompany the intubation of patients who are given curare preparations It is not known whether intubation causes electrocardiographic changes in these patients, although changes have been noted in patients when reacting strongly to the insertion of the endotracheal tube *(9)* Cardiac disturbances have also been observed at the time of extubation during light planes of anesthesia They are fleeting in character and may be minimized by inflating the patient's lungs with 100 percent oxygen before any endotracheal manipulations *(10)* Because topical cocainization of the larynx during general anesthesia and immediately prior to intubation appears to aggravate cardiac disorders, it was omitted during the present study, but, with the exception of endotracheal anesthesia for tonsillectomy in children, the tube

(7) Foldes F F and Mahaj T S Syncurine (decamethonium bromide) its use with pentothal sodium and nitrous oxide-oxygen anesthesia in abdominal surgery Anesthesiology 12 366-375 May 1951

(8) Bailey P J and Murphy F J Syncurine and endotracheal intubation Anesthesiology 12 63-66 Jan 1951

(9) Burtenn C L Zanno G and Newman W Electrocardiographic studies during endotracheal intubation effects during general anesthesia and intravenous diethylaminoethanol Anesthesiology 12 411-419 July 1951

(10) Conn J G Landmesser C M and Harmel M. H Electrocardiographic changes during extubation Anesthesiology 13 163-168 Mar 1952

was lubricated with an anesthetic ointment and a cocaine solution was instilled into the trachea on completion of the intubation

When the epiglottis is manipulated during direct laryngoscopy an elevation in both systolic and diastolic blood pressure occurs almost immediately *(11)* A further increase accompanied by a tachycardia develops after intubation of the trachea These findings were substantiated during this study Furthermore the degree of disturbance was in direct proportion to the time and effort required for laryngoscopy and tracheal intubation The blood pressure variations are not significant and are unassociated with either hypoxia or carbon dioxide retention *(12)* Original blood pressure levels and pulse rates are resumed within a few minutes following completion of the intubation

A combination of from 4 to 5 mg of decamethonium and 500 mg of a 2 5 percent solution of thiopental sodium was given to induce rapid anesthesia and to facilitate prompt endotracheal intubation The smaller dose of decamethonium was generally reserved for women and debilitated patients further variations being allowed for age and weight The rate of the intravenous injection was rapid the entire amount being given from one syringe in about 1 minute without an initial or test dose Shortly after the patient loses consciousness apnea develops and adequate ventilation with oxygen is provided using controlled respirations After the decamethonium has been injected, a minimum of 3 minutes is required for maximum drug effect and during which the pulmonary oxygen reserve is increased before intubation under direct vision is performed This method has been used in about 200 intubations and is regarded as superior to all technics previously used This type of induction was employed whenever endotracheal anesthesia was indicated The age of the patients in this series ranged from 3 to 65 years the males and females being about equal in number A deliberate effort was made to produce apnea In every instance this developed immediately after the completion of induction lasting from 5 to 33 (average 20) minutes

Thiopental sodium and decamethonium were injected intravenously in children on the basis of 2 5 mg of thiopental sodium per pound of body weight and 1 mg of decamethonium per 30 pounds of body weight In these patients the drugs were given slowly and when tonsillectomy was performed all topical anesthesia was omitted A brief period of hyperactivity may occur toward the completion of the injection and consequently care must be taken not to dislodge the needle at that time

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(11) K ng B D Hart L C J G f ast F E Eld J D Jr nd Drips R D R fl x u la ory p ns dur ct l ry gos opy d tr be l l bat e pe f rm d dur ng g ne l h ta A h l gy 12 556-566 S p 1951

(12) V lp tt P P E pe a w h ltra-sh ct g tra us ba an t mb d w b d cam h um b m d for nd tra h l ba n. A th logy l 648-655 Sept. 1951

DISCUSSION

On the basis of a limited experience with decamethonium I believe that the drug has a useful place in the preparation of the patient for endotracheal intubation and subsequent anesthesia. It is short acting and therefore controllable. Because it does not liberate histamine and autonomic ganglia are not blocked by its action, no important circulatory changes or bronchospasm occurred during the present study. The drug does not deteriorate or sediment and is readily miscible with solutions of thiopental sodium.

The combination of thiopental sodium and decamethonium has proved to be safe and superior to a combination of thiopental sodium and curare for endotracheal intubation. The period of apnea is much shorter. The technic has been found to be satisfactory for adults, children and patients who are a "poor risk." Induction of anesthesia and its subsequent maintenance are greatly simplified by the use of this drug.

The dose of decamethonium used in this study was selected on an empirical basis and the experience of other investigators. As with all other agents, the amount required was subject to individual variation. Predictable results were not encountered with smaller doses than those recommended. The ability of decamethonium consistently and adequately to prepare the patient for endotracheal intubation is probably related to its synthetic nature in that it is standardized by physicochemical processes rather than bio assay.

Perhaps the most gratifying experience with the decamethonium thiopental sodium combination when used both for endotracheal intubation and the subsequent anesthesia, was the absence of undesirable circulatory effects. In practically every instance, the blood pressure and pulse remained essentially unchanged, regardless of the duration and nature of the operation.

SUMMARY

Decamethonium thiopental sodium combinations have been used extensively in preparing patients for endotracheal intubation with gratifying results. The technic has been readily mastered by personnel with varying degrees of experience and skill. No untoward results or complications were attributable to the method. The uneventful operative and postoperative course of these patients was remarkable, but this type of technic for endotracheal intubation should be used only by persons who are adequately trained in laryngoscopy and endotracheal intubation.

BOOK REVIEWS

Diagn tic Test in Neurology A Select on for Off ce U by *R bert Wart berg* M D Forewords by *S G d Holm* M D F R S d *Sta l y Truman* M D 228 p g s Il trated The Ye r Book P bli he In Ch cag Ill publi h rs 1953 Pr c $4 50

This small clearly written well illustrated volume is intended to broaden the usefulness of the clinical neurologic examination It has been carefully prepared to fulfill this purpose The need for a complete careful, and dependable neurologic examination is stressed as a way of eliminating unnecessary laboratory work The material covers the entire central nervous system and is limited to what can be done by the examiner in the office Many illustrations demonstrate what to look for and how to interpret these generally unused but valid methods The book is organized to facilitate its use as a reference work and can be used with confidence The neurologist will find nothing new here but the physician who sees neurologic conditions only occasionally will find it very useful —*Col F R Inwood MC USA*

Comroe Arthriti s d Alli d C ndit s ed t d by *J epb L H ll nd* M D nd ollabor t ng d tors *N th R Ab ms* M D *V tor G. B lb* M D *Edw d W B l nd* M D *Ralph H Bo ts* M D *Morr s A. Bow e* M D *Howa d C. Cogg ball* M D *R be d H F yberg* M D *W ll c G bam* M D *W Paul H lbrook.* M D *J bn G Kub* M D *J b La bury* M D *Th od e A. Pott* M D *Cha le R ga* M D *Eduard F R nberg* M D *Ch l y J Smyth* M D. *Ph l p D W l* M D nd *Ph l p D W l n, J* M D. 5th ed t o c mplet ly re i ed nd r writt 1 103 page 399 Illustr ti ns L & F b ger Philad lphia P p bli h rs 1953

This new edition is generally similar to the previous editions but the sections and chapters have been changed so as to bring the discussions of related conditions closer together and nearly every chapter has been rewritten, at least in part. Entirely new chapters on corticotropin cortisone and hydrocortisone intra articular injection of hydrocortisone and low back pain and sciatica have been added The subject of arthritis in general including the social economic and medical problems concerned are presented in an excellent manner Each section is written by an authority This textbook should be of great value to students, general practitioners, internists and rheumatologists —*Col W C Berry MC USA*

MUSCULAR VIABILITY IN PERIPHERAL NERVE INJURIES (1)

ELIAS M THRONE *Captain MC USA*
WALTER H MOORE *Captain MC USA*
RAOUL C PSAKI *Lieutenant Colonel MC USA*

WHEN traumatic denervation of a muscle occurs, the immediate thought is of a surgical procedure to provide anatomic continuity for nerve regeneration An equally important responsibility of the physician is the preservation of muscular viability until reinnervation takes place In traumatic injuries from any cause, muscular viability is important This is emphasized by the biopsy reports of Bowden and Gutmann (2) indicating that denervation leads to the progressive shrinkage and ultimate destruction of the muscular fibers This shrinkage and the increase of connective tissue in the muscle may become too advanced to allow recovery after the regenerating nerve reaches the muscle

Following injury with disruption in the continuity of a peripheral nerve, the distal part undergoes a reaction of degeneration This degeneration proceeds distally until it reaches the myoneural junction in from 14 to 21 days When this occurs, the response of the muscle to a galvanic current changes from a brisk to a vermicular contraction and the response to a faradic current at ordinary intensities is lost These 2 responses are the basic features of electrical diagnosis (3)

By the use of interrupted galvanic current of definite intensity, frequency, and duration, the physician has a battery of tests which will determine such things as rheobase chronaxie, strength duration curve response to repetitive stimuli, and cathodal tetanus ratio of the muscle tested These tests will indicate whether the peripheral nerve to a muscle is normal, degenerating completely degenerated or regenerating The response to faradic stimulation is only useful to determine whether or not the muscle is denervated It is of no benefit in following the regenerative

(1) Letterman Army Hospital San Francisco Calif
(2) Bowden R E. M. and Gutmann E. Denervation and reinnervation of human voluntary muscle Brain 67 273-313 Dec 1944
(3) Kovacs R Electrotherapy and Light Therapy With Essentials of Hydrotherapy and Mechanotherapy 6th edition. Lea & Febiger Philadelphia Pa 1949

25 03 O 53

process of a peripheral nerve On the other hand tests with interrupted galvanic current can frequently show early regeneration of a peripheral motor nerve several weeks before any subjective voluntary muscular contraction occurs Even though the spread in the repetitive stimuli remains wide the strength duration curve high and steep and the chronaxie, elevated, an increase in the rheobase and tetanus ratio over the previous denervation reading indicates neurotization A further increase in tetanus ratio with flattening of the right hand portion of the curve and discontinuities in the curve indicates maturation A decrease in the spread of the repetitive stimuli at this time is confirmatory evidence of maturation

The electromyograph is also useful in following changes in muscle not only in regard to viability of the muscle but also in following the regeneration of the nerve When denervation takes place the muscular fibers become sensitive to acetyl choline which causes them to fibrillate Therefore the finding of fibrillation potentials on the electromyogram is evidence that denervation exists According to Golseth (4) the presence of these fibrillations in denervated skeletal muscle shows that there is contractile tissue having the capacity for reinnervation When fibrillation potentials occur less frequently in serial electromyograms either regeneration of the nerve or degeneration of the muscular fibers with encroachment of fibrous tissue is taking place If fibrosis is not occurring in the muscle then the gradual disappearance of the fibrillation voltages is presumptive evidence of neurotization The continuation of this process with the appearance of complex motor unit potentials is indicative of maturation

We are deeply concerned with this fibrosis or loss of viability Although inadequate blood supply may predispose to muscle fibrosis (5) we believe that in many patients with an intact blood supply denervation is the only lesion truly affecting the muscle It would be futile to have regeneration of the nerve occur, whether spontaneously or following neurorrhaphy or neurolysis, if nothing but connective tissue remained where once a muscle existed Regeneration of the nerve to a viable muscle would also be useless if the joint controlled by the muscle were ankylosed The technics for maintaining joint mobility are readily recognized but the therapeutic procedures necessary to maintain muscular viability are not so readily recognized Furthermore we believe the medical profession in general is less cognizant of this problem

(4) Gol h J G P nal mm ca on
(5) P ki R C d Sch ld C. D Isch mic ct f rt or bul muscl epo t f s A h Phy M d 33 153-155 Ma 1952.

The use of electrical stimulation must be based on the preservation of contractile elements of muscle as there is no experimental evidence that it influences the regenerative process of the motor nerve The value of electrotherapy has been demonstrated by several workers *(6-23)* Fischer *(24)* and Fischer and Ramsey *(25 26)* showed that the retardation of weight loss of

(6) Fischer E Effect of faradic and galvanic stimulation on course of atrophy in denervated skeletal muscles Am J Physiol 117 605-619 Nov 1939

(7) Gutmann E and Guttmann L. Effect of electrotherapy on denervated muscles in rabbits Lancet I 169-170 Feb 7 194

(8) Langley J N and Hashimoto M. Observations on atrophy of denervated muscle Am J Physiol 49 432 1914-1915

(9) Grodins F S Osborne S. L. Johnson F R and Ivy A C Stimulation of denervated skeletal muscle with alternating current Am J Physiol 142 216-221 Sept. 1944

(10) Grodins F S et al. Effect of appropriate electrical stimulation on atrophy of denervated skeletal muscle in rat Am J Physiol. 142 222 230 Sept 1944

(11) Kosman A J Osborne S L and Ivy A. C. Effect of electrical stimulation upon course of atrophy and recovery of gastrocnemius of rat Am J Physiol 145 447-451 Feb 1946

(12) Kosman, A. J Wood E C. and Osborne S L Effect of electric stimulation upon atrophy of partially denervated skeletal muscle of rat Am J Physiol 154 451-454 Sept. 1948

(13) Kosman, A J Osborne S L and Ivy A. C. Importance of current form and frequency in electrical stimulation of muscles studies in retardation of muscle atrophy and gain. Arch Phys Med 29 559-562 Sept 1948

(14) Hines H M Effects of immobilization and activity on neuromuscular regeneration J A M. A. 120 515-517 Oct 17 1942

(15) Hines H M. Physiologic basis for treatment of paralyzed muscle Arch Phys Therapy 24 69-73 Feb 1943

(16) Hines H. M. Thomson J D and Langworthy B Quantitative studies on muscle and nerve regeneration in rat Am J Physiol 137 527 532 Oct 1942

(17) Hines H M. and Wirhmacher W H Physiologic factors involved in atrophy and regeneration of skeletal muscle J Iowa M. Soc 34 142 145 Apr 1944

(18) Wirhmacher W H Thomson J D and Hines H M. Effects of electrical stimulation on denervated skeletal muscle Arch Phys Med 26 261 266 May 1945

(19) Eccles J C Investigations on muscle atrophies arising from disuse and tenotomy J Physiol 103 253-266 Dec 15 1944

(20) Jacksan S (Oxford) Role of galvanism in treatment of denervated voluntary muscle in man. Brain 68 300-330 Dec 1945

(21) Pollock L J Arieff A. J Sherman I C. Schullinger M. Tigay E Hollinger F Lippert, E., and Yacorzynski G K. Electrotherapy as experimentally produced lesions of peripheral nerves Arch. Phys Med 32 377 387 June 1951

(22) Osborne S L Retardation of atrophy in man by electrical stimulation of muscle Arch Phys Med 32 523-528 Aug 1951

(23) Solandt, D Y DeLury D B and Hunter J Effect of electrical stimulation on atrophy of denervated skeletal muscle Arch Neurol & Psychiat. 49 802 807 June 1943

(24) Fischer E. (Richmond V.) Some enzyme systems of denervated muscle Arch. Phys Med 29 291 300 May 1948

(25) Fischer E. (Richmond V.) and Ramsey W W Changes in protein content in the physicochemical properties of protein during muscular atrophy of various types Am J Physiol 145 571 582 Feb 1946

(26) Fischer E (Richmond, V.) and Ramsey W W Effect of daily electrical stimulation of normal and denervated muscles upon the protein content and some of the physicochemical properties of protein. Am J Physiol 145 583 Feb 1946

muscle is accompanied by a retardation of the loss of adenosinetriphosphatase activity They also reported that after denervation of the gastrocnemius muscles of a rabbit myosin decreases considerably with progressive atrophy Like the weight loss this deterioration of *muscular protein is retarded by* appropriate muscular stimulation Thus adenosinetriphosphatase diminishes because of disuse of this enzymatic system, finally leading to deterioration of the myosin

Potassium also plays an important role in muscular metabolism The contractile power of muscle is affected by a decrea e of the potassium concentration in its fibers Fenn *(27)* showed that *besides this direct involvement in the contractile* mecha nism potassium apparently aids in keeping myosin in its proper colloidal state so that the folding of the myosin chain molecules can occur *This causes shortening of the muscle A relation* ship between denervation atrophy of muscle and potassium loss was also presented by Fischer *(28)* He showed a fairly constant ratio between extractable myosin and loss of potassium and noted that daily electrical stimulation of the denervated muscle pre vented loss of potassium This preservation of muscular potas sium is further evidence of the value of electrical stimulation

DISCUSSION

The ultimate result of muscular denervation is complete loss of viability of the muscular fiber and encroachment by fibrous tissue unless reinnervation takes place In peripheral nerve injuries there is often a partial irreversible muscular degenera tion before reinnervation occurs Because viable muscle is criti cal in the recovery of function, the importance of maintaining it *should probably be rated along with the treatment of fractures* or the surgical treatment of injured nerves Measures to insure muscular viability should be instituted early and used con tinuously until regeneration of the nerve occurs If there is a minimal loss of muscular viability with its accompanying fibro sis scattered through the muscle the prognosis becomes poor Fibrosis creates barriers which isolate viable muscular fibers from regenerating nerve axons This is shown by the finding of fibrillation potentials in the electromyogram long after a muscle resumes voluntary contraction We have observed this on nu erous occasions and it has been reported by Weddell et al *(29)* Following nerve suture Bowden and Gutmann *(9)* demonstrated

(27) F W O Co tractil ty I Höber R. t l Phys c l Ch m try of Cells nd T s Th Bl k Co Ph lad lph P 1945

(28) F h E P tu m in d rvat d urea d od u ed mus le Arch Phy Med 30 375-38 J ne 1949

(29) W dd ll G F ns B d P l R E El tr cal ty I l sary mus l in ma und ormal od path l g cal ond ns Br 67 178-257 Sept. 1944

by biopsy, abundant nerve fibers in severely fibrotic muscles which had no voluntary contraction

The present methods of maintaining muscular viability are subject to further investigation Those currently used include (1) early and adequate surgical care, (2) support of the involved extremity with adequate functional bracing allowing for joint motion, (3) adequate nutrition of the patient, and (4) electrical stimulation of the involved muscles Of these, the one specific measure directed at muscular viability is electrical stimulation The type of current is unimportant The main point is that adequate contraction be made to occur

SUMMARY

Therapy directed toward maintaining muscular viability should be started as early as is medically feasible and continued through the period of denervation and reinnervation The importance of early and continuous treatment of denervated muscles should be given equal consideration with the management of fractures and the surgical treatment of injured nerves

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BOOK REVIEWS

Principles and Technique of Exodontia by *Frank Wendell Rounds* A B D D S Sc D (Hon) Late Dental Surgeon to Brooks Hospital Courtesy Staff Phillips House Massachusetts General Hospital Diplomate American Board of Oral Surgeon Past President of the American Society of Oral Surgeon and of the American Academy of Dental Science Formerly Professor of Oral Surgery and Anesthesia Louisville College of Dentistry and *Charles Elder Rounds* A B D M D Assistant Dental Surgeon Massachusetts General Hospital Visiting Instructor in Oral Surgery Tufts Dental School 407 pages illustrated The C V Mo by Co St Louis Mo publisher 1953 Price $10

The "how," not the "why" of exodontia is the primary aim of the authors in this new text It is particularly designed for use by the undergraduate and the general practitioner, as it includes many of the small details of operative technic which are so frequently omitted in older texts Although some parts tend to be repetitious the author probably believed that this was necessary to impress the intended reader with essential details Excellent descriptions of the technical details involved when dealing with impacted teeth, as a discussion of radiographic interpretation have and all phases of the subject matter well illustrated by photographs and sketches

—*Comdr A S Turville DC USN*

muscle is accompanied by a retardation of the loss of adenosinetriphosphatase activity They also reported that after denervation of the gastrocnemius muscles of a rabbit myosin decreases considerably with progressive atrophy Like the weight loss this deterioration of muscular protein is retarded by appropriate muscular stimulation Thus adenosinetriphosphatase diminishes because of disuse of this enzymatic system finally leadin to deterioration of the myosin

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(29) W dd ll G F B d P l R E El tr l ty f l tary mu l i ma nd ormal od path l g l oad Br 67 178-257 Sept. 1944

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—*Comdr A S Turville, DC, USN*

United States Army in World War II The Technical Services the Quartermaster Corps Organization Supply and Services by *Erna Risch* 8vo cloth *Office of the Chief of Military History Department of the Army* Washington D C 418 pages illustrated U S Government Printing Office Washington D C published 1953 Price $3 25

This is the latest volume in the series U S Army in World War II and is the first in a group of 4 dealing with the Quartermaster Corps It depicts the activities of the corps in the zone of the interior during the period of rapid expansion and administrative adjustments brought on by the war The tremendous achievements of the corps are described without boast and the miscalculations that were made are related without apology The book contains much material of interest to Medical Service personnel such as that relating to nutrition field sanitation clothing and shelter Of broader interest is the clear demonstration that a peacetime organization must be easily adaptable to mobilization needs that continuous military research is essential and that planning must be conducted with vision and realism —*Col C O Bruce MC USA*

Medical Biography The Anatomy of Thirty-three Famous Persons by *Philip Wagner Bell M D* 259 pages illustrated University of Oklahoma Press Norman Okla published 1952 Price $4

What I have tried to do is to illuminate a dark corner of legitimate biography in a few select instances, with the light of medical understanding" The author's success in reaching this goal is demonstrated in the 33 sketches dealing with ailments of well known historical personages Each sketch forms an independent unit Although one may not necessarily comprehend the compelling force of Napoleon's lust for power or Byron's genius the common bond of pain and death will generate compassion for the strutting little corporal with peptic ulcer and the handsome poet whose brain was congested whose heart was enlarged flabby and the ventricular walls thin The persons discussed take on a new dimension of reality for the reader He is impressed with the fact that in our time the life span of certain of the great —hearts for example—could have been lengthened by medical science and he admits that death is undeniable and unalterable coming alike to philosopher statesman and scientist yet recognizes with the author that he who conquers the fear of death has in a humanistic sense conquered death itself This is a volume which might well be put to good use in the doctor's waiting room —*M M Link Ph D*

PARACOLON CARRIERS AMONG FOOD HANDLERS

EVELYN K TATSUNO B Sc (1)

O A BUSHNELL Major MSC USAR (2)

ORGANISMS belonging to the genus paracolobactrum are said to be intermediate between the coliform organisms and species of salmonella and shigella They differ from the coliform bacilli by their consistently late fermentation of Lactose or by their failure to ferment it at all, and from the salmonellas and shigellas by fermenting lactose, sucrose, or salicin Three species have been reported (1) *Paracolobactrum aerogenoides* resembling *Aerobacter aerogenes* and *Aerobacter cloacae* (2) *Paracolobactrum intermedium* resembling *Escherichia freundii* and *Escherichia intermedium* and (3) *Paracolobactrum coliforme* resembling *Escherichia coli* For man, certain strains are pathogenic, certain other strains are suspected of being pathogenic and some are thought to be nonpathogenic (3 5)

Because of the possibility that the paracolon bacteria may cause enteric disease, and in an effort to determine their incidence in a normal healthy" population on Oahu, Hawaii, a survey for the presence of paracolon organisms in a particular occupational group was conducted The group surveyed was made up of civilian and military food handlers employed at military installations on Oahu The stool specimens were sent to Tripler Army Hospital in Honolulu for the required periodic examinations for enteric pathogens and for parasites and ova Of the many specimens received at the hospital laboratory 100 selected at random, were used in this study Apparently this is the first survey of this kind undertaken in Hawaii

METHODS

The usual methods employed by clinical bacteriologists for the isolation, purification, and study of suspected pathogens

(1) Intern in Medical Technology at Tripler Army Hospital 1952 1953 when material for this paper was gathered.

(2) University of Hawaii Honolulu Hawaii

(3) Stuart C. A. and Rustigia R. Further studies on one type of paracolon organism. Am. J Public Health 33 1323-1325 Nov 1943

(4) Barnes L. A. and Cherry W. B. Group of paracolon organisms having apparent pathogenicity Am J Pub Health 36 481-483 May 1946

(5) Fulton M. J. Fundamentals of Bacteriology W. B. Saunders Co Philadelphia P. 1950

were used Selenite F broth or tetrathionate broth were used as the enrichment media SS agar and desoxycholate citrate lactose sucrose agar were used concurrently as the plating media Colonies suspected of being nonlactose fermenters were purified o Levine s E M B agar and MacConkey agar plates More than 1 suspected colony was picked when they showed different colonial characteristics Smears of the purified cultures were gram stained and all gram negative bacilli were maintained on slants of stock culture agar (Difco) The criteria for identification of the paracolon organisms are those offered by students of the group *(3 4)* and summarized by Bergey *(6)* Serologic confirmation using specific antiserum was possible for *P intermedium* strains only

RESULTS

Of the 100 stool specimens examined 36 percent were positive for paracolon organisms 17 percent were positive for *P aerogenoides* 12 percent were positive for *P intermedium* 9 percent were positive for *P coliforme* and 5 percent were positive for both *P aerogenoides* and *P intermedium* Suspected organisms were found to belong to genera other than paracolobactrum and on further study were attributed in most cases to the genera alcaligenes pseudomonas or proteus Some pecimens which yielded paracolon organisms also harbored salmonella or shigella species The results of the survey for salmonellas and shigellas are not included in this report

Of the 17 specimens positive for *P intermedium* 4 had organisms with IMVIC reactions similar to those of *E freundii* 12 had organisms with IMVIC reactions similar to those of *E intermedium* and 1 had organisms of both types

After grouping the organisms according to their IMVIC reactions the usual biochemical tests coincided well with the reactions listed for the several species of paracolobactrum in Bergey s manual An exception was found in the reversal of the hydrogen sulfide production reactions in the *P intermedium* group A few of the inevitable variations occurred in the reactions of the sugar fermentation tests for strains of each of the 3 groups There was no consistency in the test for delayed urea e production except that the *P coliforme* group did not produce urease

The possibility that the suspected paracolon organisms may belong to either the almonella or the shigella group is removed by their reactions on Simmons citrate agar their production of indole and their ability to produce gas (The salmonella specie

(6) B ed R. S. Murray E G D ed H h A P Bergey Ma ual f Determ

do not produce indole and do not utilize citrate as their source of carbon) All of the suspected paracolon strains produced positive reactions on either or both of these test media The production of gas in at least 1 sugar fermentation reaction eliminated the possibility of the suspects being shigella species

Three organisms in the *P intermedium* group showed strong agglutination when tested with a polyvalent salmonella antiserum (No antiserums were available for studying the other paracolon strains, so no serologic confirmation of cultural reactions could be made)

CONCLUSIONS

The incidence of paracolon organisms in a group of 100 food handlers distributed among several military installations on the island of Oahu was found to be 36 percent *P aerogenoides* was the species most commonly found, *P intermedium* was next, and *P coliforme* was least commonly encountered Dual occurrences were observed in 5 percent The possibility that these carriers of potential pathogens might act as sources of infection cannot be discounted

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BOOK REVIEWS

Problems of Infancy and Childhood Transactions of the Sixth Conference March 17 and 18 1952 New York N Y edited by Milton J E Senn M D Sterling Professor of Pediatrics and Psychiatry, Yale University School of Medicine New Haven Conn Sponsored by the Josiah Macy, Jr Foundation New York N Y 160 pages Printed by Foundation Press Inc Jackanack Lake N J 1953 Price $2 00

This small volume might better have been titled "The Problem of Understanding Infancy and Childhood" The conferences here reported consisted of 7 presentations followed by free discussions Dr Escalona spoke on her observations and tentative conclusions regarding the emotional development in the first year of life Dr Wolf presented observations of individual reactions in the first year of life and the significance of these findings in infants An interesting effort [illegible] the individuality of the infant in terms of his interaction with [illegible] environment was evident in the [illegible] Many, although not firm conclusions were reached as to the problems of infancy and childhood as [illegible] informative review of World Health [illegible] presented by Dr Kaufman [illegible]

Officer for Europe World Health Organization This book is heartily recommended to all who are interested in the problems of infancy and childhood —*Lt Comdr R E Switzer MC USN*

M s D se by *H nry L. W llt m* M D M S. Ot l He d of Sect n f Otol ry g l gy and Rh l gy M yo Cl c Pr f sor of O olaryng l gy d Rh logy M yo F dat o C d t School of Uni e s ty f M nn ot R heste M nn Am c n L tur Se Publ ca on N mb 129 A M ogr ph n th B n to e D vi io f Am c n L tur n O l ry g l gy A d l gy nd Br h E ph g l gy d ted by *Nort C f ld* M D A o e Cl c l Pr fe so f Ot laryng l gy Y l U i ty Sch l f M d e N w H n Co 349 p g llu r t d Ch l C Thom P bl he Spr ngf ld I l 1952 Pric $7

This is the most complete work published in recent years on Meniere s disease An exhaustive bibliography and review of the literature is presented The author has given due attention to the points of confusion in the recognition and treatment of this disease In the first chapter he evaluates the subject as Meniere presented it and defends his conception of the symptom complex The anatomy and physiology of the labrynth is discussed in minute detail Similarly the cause pathology and diagnosis are described with great care Perhaps the greatest value of this monograph lies in the section devoted to treatment. Many pa tients have been found to respond to quite simple medical measures The author believes that the disorder is an allergy of the so-called physical type Therapy directed toward con necting this theoretical autonomic imbalance particularly the use of the recently introduced cholinerogolytic drugs has been highly successful in producing symptomatic relief In medical failures of the dangerous utricular attacks he advises one of the surgical procedures aimed at destroying the labrynth

—*Comdr J A Fields MC USN*

A METHOD FOR SCREENING NONPATHOGENS IN FECES[1]

ARVEY C. SANDERS *Lieutenant Colonel MSC USA* (2)

KENZO OKABE *Ph D*

THE desirability of a method for handling large numbers of stool cultures when surveying for enteric pathogens has long been recognized This need became particularly ur gent in the early days of the Korean campaign because the oc currence of acute enteritis placed a severe workload on the facili ties of a medical general laboratory (3) A method was developed under emergency conditions which has withstood the test of con tinued use (4, 5)

Following the onset of hostilities in Korea it was not unusual to receive 200 stools per day for culture The conventional meth ods used in screening these specimens for enteric pathogens were almost prohibitive from the standpoint of time, space, and materiel requirements Routine definitive methods are designed to remove concomitant intestinal flora such as escherichia, proteus, and paracolobactrum, so that the nonlactose and non sucrose fermenting group of organisms can be biochemically and serologically identified In this laboratory, established pro cedure had required that fecal material be streaked on salmonella shigella (SS) and MacConkey's agar plates

After from 18 to 24 hours of incubation, suspected colonies were selected and transferred to a tryptose phosphate broth de signed to enhance their growth preparatory to the inoculation of kligler's iron agar, citrate agar, and motility medium Because experience in the Far East had shown occurrence of multiple infections in individual patients or outbreaks (4 6), several

(1) 406th Medical Gen ral Laborat ry U S Army

(2) Present ddress Army M dical Service Graduate School Walter Re d Army Medical Center Washington D C

(3) Hardy A V Mas R P and Martin G A Dyse terie in Armed Fo s Am J Tr p M d 1 171 175 Jan 1952

(4) Zimm rman L E Cooper M a d Graber C D *Bacteriologic studi in epi* d mic of bac llary dys ntery in Korea serotypes of shigella and s lmo lla recov r d nd bact r ol gic f spons t sulf di zi chloramphenicol terramy in aureomycin nd str pt mycin. Am J Clin P th 22 549-557 June 1952

(5) Hardy A V Personal communic tion 1952

(6) Elrod R P Sander A C and Hullinghorst R L Isolation of 3 Shig lla p rdys nteria serotype from 1 patient U S Armed Forces M. J 1 1299-1300 Nov 1950

colonies were selected in each case for study As many as 3 distinct serotypes at times were isolated from a single patient. Accordingly after from 18 to 24 hours of incubation a minimum of 10 morphologically suspected colonies (5 from SS and 5 from MacConkey s agar) were selected from the initial cultures If 4 differential substrates were inoculated with each of the 10 colonies selected it would result in 8 000 tubes of differential media being required daily for the handling of 200 specimens

A medium was desired which would eliminate the lactose-sucrose fermenting group of intestinal organisms prior to the inoculation of differential substrates This could be accomplished by combining a tryptose-phosphate booster broth with a basic biochemical screening system allowing growth of enteric organisms, and early elimination of aerobacter proteus and virtually all of the paracolon group Such a medium incorporating lactose and sucrose was prepared as follows

Tryptose	20 0 grams
Dibasic sodium phosphate	1 0 gram
Sodium chloride	5 0 grams
Bromcresol purple (1 6%)	0 5 ml
Water distilled	1 000 ml

Autoclave the basic medium at 15 pounds pressure for 15 minutes

Allow to cool and aseptically add

Lactose (difco concentrate 10%)	10 ml
Sucrose (difco concentrate 10%)	10 ml

Nonlactose fermenting colonies are picked from the SS and MacConkey s agar plates and transferred directly to the lactose sucrose broth described above All tubes are incubated overnight (from 15 to 18 hours) after which the acid cultures are discarded but caution must be exercised to preclude the elimination of sucrose fermenting *Vibrio comma* The nonacid cultures are transferred to the various differential substrates and identified in the usual manner Indole reactions are not impaired by this carbohydrate broth

Use of this double sugar booster medium is somewhat different from the usual practices of isolating enteric pathogens in that it makes available certain biochemical data prior to the testing for other differential reactions In the preliminary testing 90 strains of salmonella and 62 strains of shigella were used to check the reactions of this medium These strains represented virtually all serotypes were freshly isolated from patients under

going treatment in Japanese hospitals None, except *Shigella ceylonensis* produced an acid reaction The late lactose fermenting coliform organisms were likewise tested, and all produced acid reactions after overnight incubation It was possible in this experimental series to eliminate more than 50 percent of the colonies initially selected as possibly pathogenic When the use of this medium was adopted as a standard procedure, 1,502 lactose-sucrose fermenters (proteus, aerobacter, paracolobactrum) were eliminated from 3,272 initially suspected colonies, thus allowing a corresponding reduction in further identification Similar results have been subsequently obtained by Hardy *(3)* and Zimmerman et al *(4)* in extensive field use of this lactose sucrose booster broth

SUMMARY

Overnight incubation with a booster broth medium containing lactose and sucrose provides for the elimination of 50 percent of the possibly pathogenic nonlactose fermenting colonies selected from the initial plating media prior to the inoculation of various differential substrates Use of this medium in large scale bacteriologic studies of enteric disease outbreaks has allowed efficient, accurate and economic handling of large numbers of fecal specimens

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BOOK REVIEW

Pathology of the Heart edited by S E *Gould* M D D Sc Clinical Professor of Pathology Wayne University College of Medicine Detroit Mich Pathologist Wayne County General Hospital Eloise Mich Consultant in Pathology Veterans Administration Hospital Dearborn Mich Editor American Journal of Clinical Pathology 1023 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $25 50

The publication of this book at a time when so much emphasis is being put on heart disease is opportune If for no other reason than to present in one volume an edited collection of available factual data about the heart, this is a valuable contribution to medical literature The editor and his collaborators, all of whom have qualifications that make their contributions authoritative, have put these data together clearly, concisely, and readable Starting with a historical chapter and ending with an appendix containing detailed instructions for gross examination of the heart together with weights and measurements, the [illegible] chapter headings are included The development of the [illegible]

The Structure of the Adult Heart Physiology of the Heart Congenital Malformations of the Heart and Great Vessels Degenerative Diseases Vascular Lesions of the Heart Rheumatic Disease of the Heart Nonrheumatic Inflammatory Diseases of the Heart Parasitic Diseases of the Heart, Injuries of the Heart and Pericardium by Physical Violence Neoplasms of the Pericardium and Heart and Clinicopathologic Correlations

Outlines of the material presented are used at the beginning of each chapter a practice that makes it easy to look up data for reference and to summarize the contents Illustrations in black and white and in color are used effectively throughout the book as are tabulations of pertinent data in many of the chapters Extensive bibliographies regarding each subject presented are placed in chronological order at the end of each chapter This manner of presentation makes it easy to use these bibliographies Complete author and subject indexes are included The print is exceptionally clear The binding and the cover of Du Pont fabrikoid are excellent

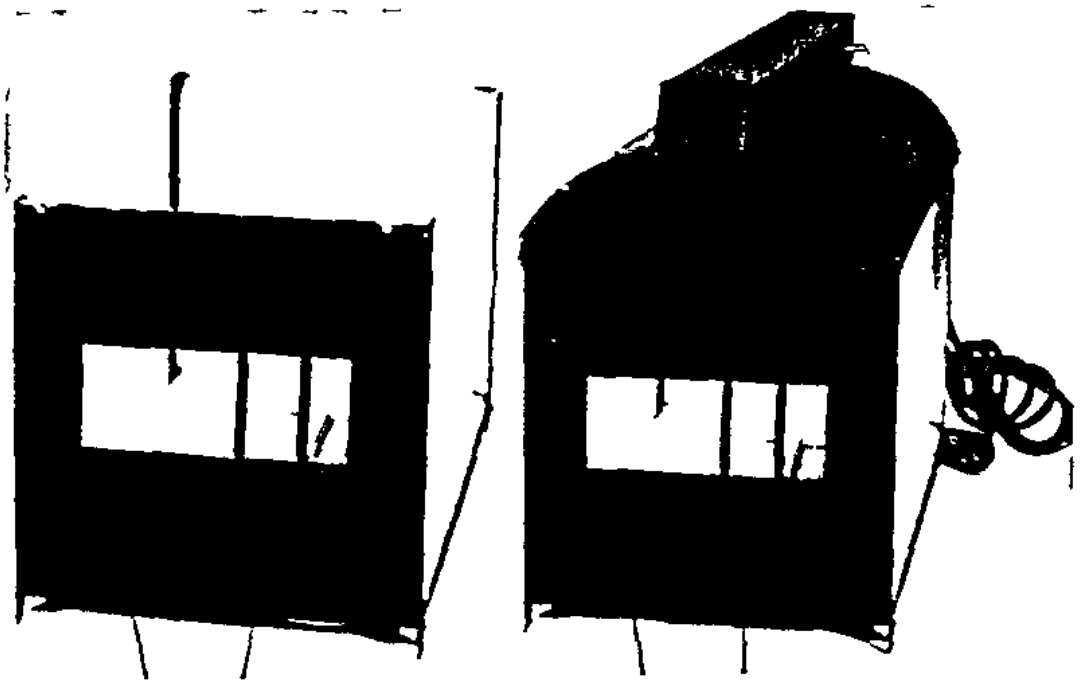
One must be hypercritical to find points to which to take exception and this reviewer finds none that he considers significant Recognizing that concessions must be made to a living language but with no challenge to the etymologic correctness it might be better to describe endothelium as squamous mesenchymal epithelium" rather than a simple squamous epithelium inasmuch as the term squamous epithelium may connote an epidermoid structure to many readers The occurrence of tricuspid endocarditis in narcotic addicts who develop blood stream infections with staphylococcus is not mentioned nor is this association included in the discussion of the factors of localization in bacterial endocarditis A difference of opinion is expressed in the chapters on rheumatic heart disease and on nonrheumatic inflammatory diseases of the heart as to whether or not mural endocarditis of the ventricles occurs in rheumatic fever These things are minor however and do not detract from the value of the book

No better summation of a critique of this work can be made than is given in the foreword by Howard T Karsner M D This book is a superb contribution to the literature of pathology medicine and biology and should be welcomed in the special field of cardiology —*Comdr W F Pierce MC USN*

MODIFICATION OF THE DEPTH PERCEPTION APPARATUS

PHILIP A PETER *Captain USAF (MC)* (1)

A large number of candidates for drivers' licenses, as well as an increasing number of aviation cadet applicants and aircrewmen are examined daily in the eye clinic of this hospital The stereopsis test performed with the standard issue Depth Perception Apparatus (#3 247 500 Armed Services Catalog of Medical Materiel), is given both drivers and flying personnel In their eagerness to qualify for flying training or to continue on



F g e 1 *The standard issue depth perception apparatus* (A) *befo e and* (B) *after mod f cation.*

flying status, many examinees are anxious to find extraneous clues to stereopsis such as shadows, to assist them in satisfactorily passing the depth perception test This report describes a simple and inexpensive modification of the issued item by which a more accurate test can be performed and much time saved.

In the standard apparatus (fig 1a) there are no provisions for a shadowproof light or means of excluding from the examinee the

(1) U S. Air F rce H p tal Francis E Warren Air For e Ba Wyo

visualization of the pins over the top of the front surface The apparatus is modified (fig 1b) by suspending a shadow proof fluorescent light a short distance above the pins of visual fixation and adding a cover on top Painting the background sur

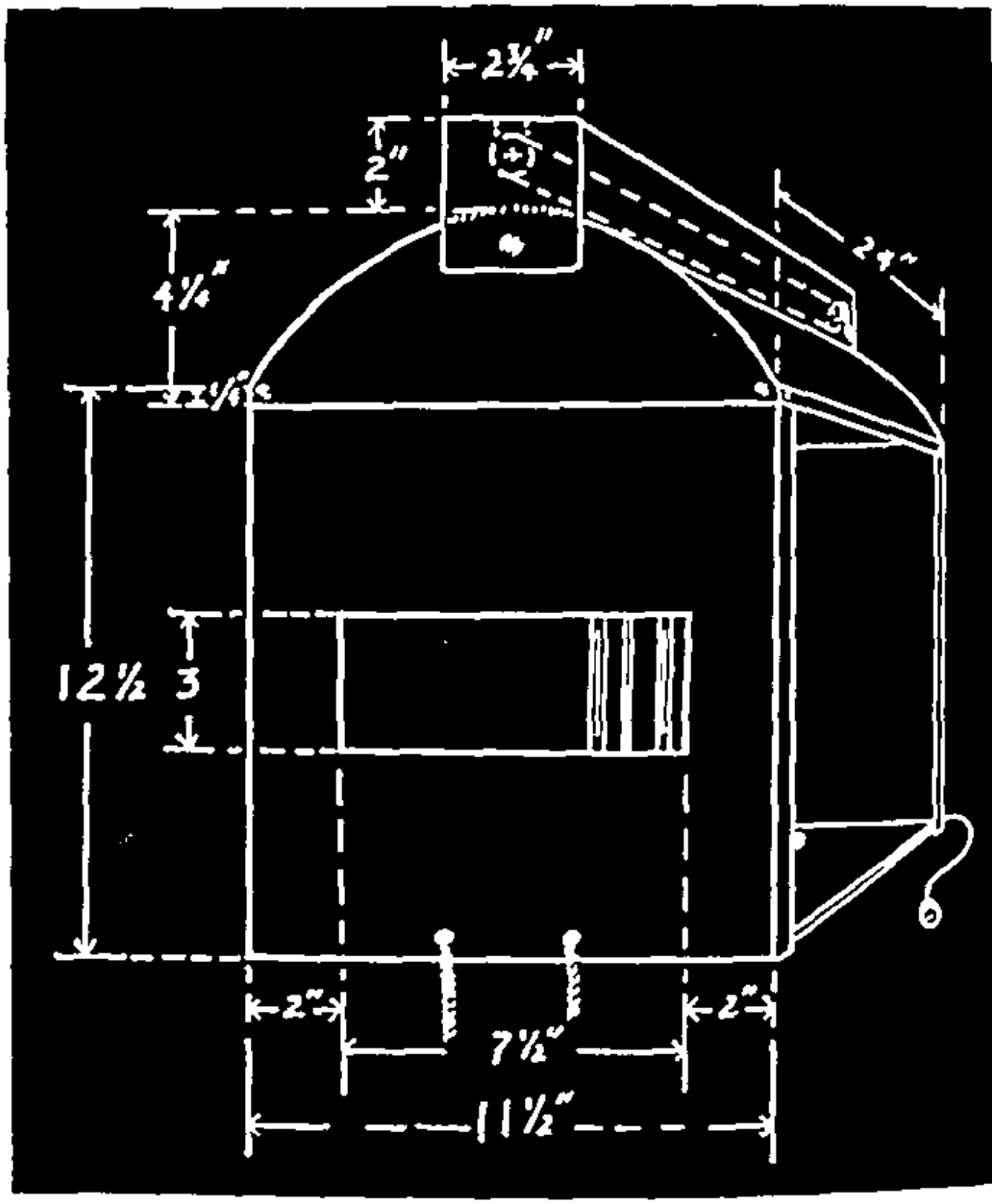


Figure 2 Drawing showing the measurements of construction of the modified standard depth perception apparatus

face and the inside of the roof with a low reflecting white paint makes the apparatus more accurate

The measurements for constructing the top and lighting unit are given in figure 2 Figure 3 shows the basic measurements of the unmodified apparatus The top consists of 2 semicircular sheets of scrap tin (with holes for mounting) on each end of the

apparatus, a rectangular tin box to house a 10 watt fluorescent light and its vibrator unit, and 2 flat sheets of tin to complete the cover The roof may be detached simply by removing the 4 corner bolts

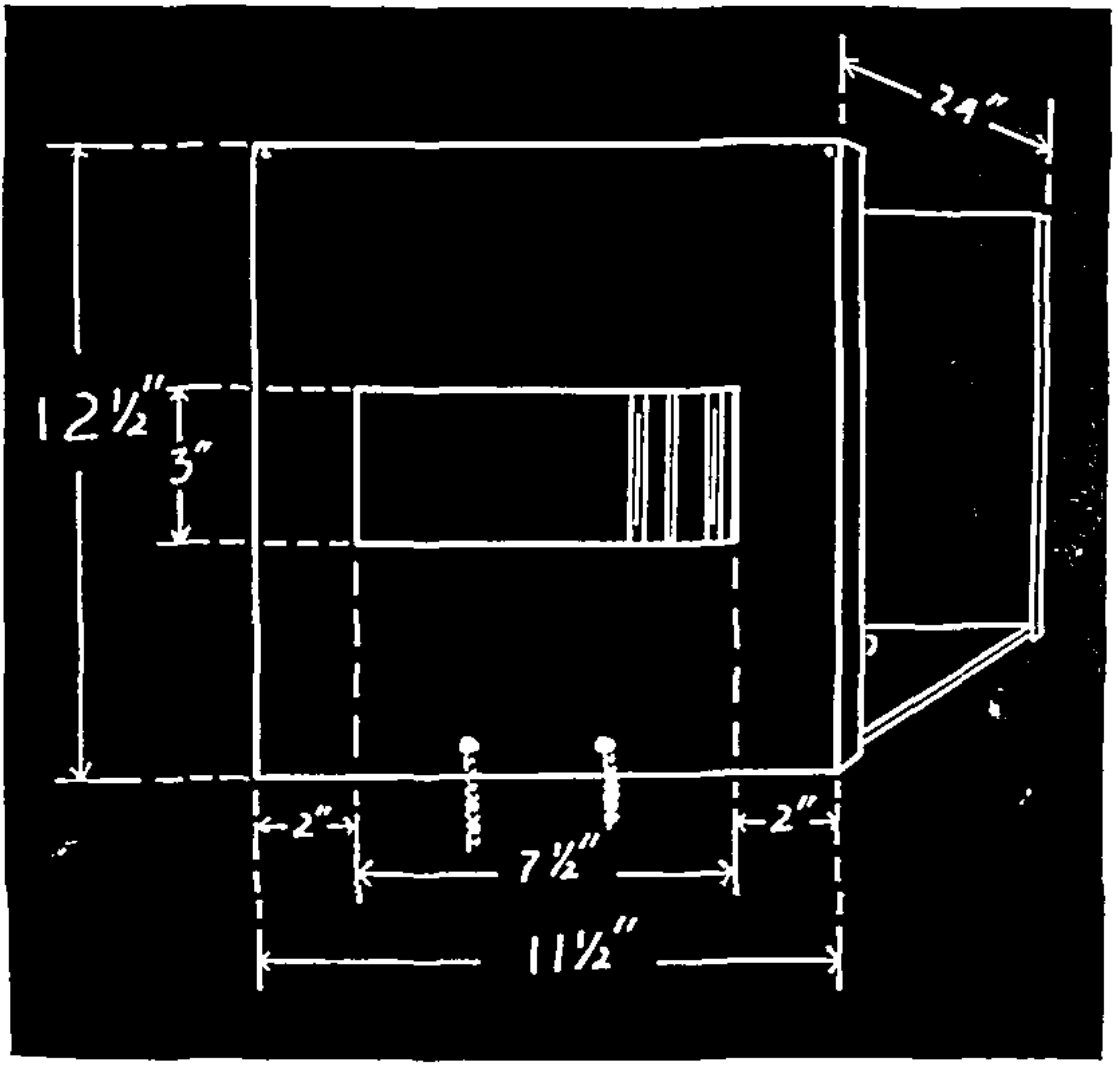


Figure 3 Drawing showing measurements of construction of the standard depth perception apparatus

As compared to the standard apparatus, the modified apparatus has proved to be (1) more intensely and uniformly illuminated, (2) less confusing to the examinee because fewer moving parts are visible (3) more accurate because of the absence of extraneous clues to depth, such as shadows, irregular light reflexes, and visualization of the tops of the pins and (4) more stable

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BOOKS RECEIVED

Derm tol gy Ge eral Pra tice by *J b Hyam Swa t* M D A sistant Pr f t f Dermat l gy H rv d Med cal School nd P st-G ad Sch l C sult g Derm t log t Ma s chusett Ge er l H p l M mb r Ameri Dermatolog l A so i ti Ame ca My ol gical A so iati D plomat Amer c Board f D rm tol gy For w rd by C. G y L M D Pr f o Eme itu Dep tm t f Dermat l gy H d Med l School Con lt g De mat l gi t Ma s chu tts Gener l Hosp t l 581 page ill tr ted Th W lliams & W lk Co. B lt m Md p blish r 1953 Pr $11

Funct onal d Surg c l A tomy of th H d by *Em el B. A pl* M D F A C S Ass t t P f sor f Anat my C ll g of Phy ic s d Surge ns Col mbia Uni e ty Att nd ng Orth ped c Surgeon of the Hosp t l for Jo t D Att nding Orth ped c Surgeon of th Leba on H p tal Med cal D rector Beth Abr ham H m N w York, N Y 288 pag s ill t at d. J B L pp ott C Ph l d lph P p bl h rs *1953 Pr c $10*

Hea t d Cir lat D gn d T tm nt by *Mey r Sci* M. D. F A C C. Ch f i Ca d l gy d Se or At e d g Phy cia U ty Hosp tal Con ltant Ca d l gy Rockaway B ch Hosp tal nd Mad Pa k Hosp t l A oc t Atte ding i Medi i n d Ca di l gy K g Cou ty H p t l B ookly N Y A isted by *J b M l k* M D 357 p g ill trat d F ob P e Inc N w York N Y publish rs 1953 Pr c $7 50

Off ce Orthoped i by *L wi C en* M D F A C S Att ndi g Orthoped c St ff Th Orth ped H p t l V t Hosp t l Los Angel County H p tal Ced rs f Leba on H p tal L A g l nd L Ang l s T be ulos San t m Mon i C l f A i t t Pr f or of Or h ped c Surg ry C lleg of Med l E g l t Los A g le 304 pag illustrat d 2d d t on enla g d a d d L & F b g r Phil d lphia P p bl sher 1953 P ice $5 50

Contact Dermatiti by *G g L. W ldb ll* M D F A A. A F A C. A. F *I* A A F A C. P *Se or Phys cia Harpe* Hosp tal Chief f D s on of All gy A si t t Phys c Ge Hosp t l Ch ef of All gy Cl Forme ly Dir ctor f Alle gy Cl n Ch ldr s Hosp tal of M h ga F m ly Co lt t All rg st St Mary H p tal a d North End Cli Detr M ch Ame i L ture Seri s P bl t on N 133 A M n gr ph Th Ban er too D on ol *Amer L ru D rmat l gy* d t d by *A thur C. Curt s* M D. Ch irma Departme t f Dermat logy d Syph l l gy U ers ty of M h ga A A bor Mich 218 pag ill tr t d Ch l C Th ma P bl h Spr gf ld Ill 1953

The Roots f Psych therapy by *Carl A. Wh t ke* M A M D P of or of P y h try d Ch irma of th *Depa tme t* of P y hiatry Emory U ty Scho l f Medi e nd *Th ma P M l* M A Ph D. A ist P f or of P y h try d Dir ctor of R rch Depa r ment f P y hi try Emory U r ity School of M d i 236 pages Illustr d Th Blak ton Co N w Y k N Y p bl her 1953 $4 50

TREATMENT OF CRYPTOCOCCOSIS WITH TERRAMYCIN[1]

BEN D HALL *Captain MC USA*

RICHARD E MARDIS *Major MC USA*

REPORTS of cryptococcosis, a relatively rare fungus disease due to *Cryptococcus neoformans* with predilection for the lungs, brain, and meninges, have appeared in the literature periodically since 1902 Reviews of the literature published in 1950 mention 127 (2), 165 (3) and over 200 (4) cases reported up to that time Accepting Mosberg and Arnold's (5) figure of 172 cases of cryptococcosis of the central nervous system and adding cases reported subsequently (2-4), (6-12), the total (including our case) is at least 189 The following case illustrates (1) a common pitfall in the differential diagnosis (2) early pleural involvement, an unusual finding, and (3) the failure of terramycin together with conventional therapy to alter the course and fatal outcome of the disease

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(1) Fr m Tripl r Army Hosp tal Hon lul T H

(2) Ratcliff H. E and Co k W R Cryptococcosis r ew of l teratur and report of case with initial pulmonary findings U S Armed For e M. J 1 957 969 Sept 1950

(3) Gendel B R End M. and Norma S L Cryptococc sis r v w w th pecial r f r nc to ppa e t as ociat o with Hodgki s dis se Am J Med 9 343 355 Sept 1950

(4) C llins V P Bone i volvement i cryptococ osis (torulosis) Am J Roe tge l 63 102 112 J 1950

(5) Mosberg W H Jr and Arn ld J G J Torulosis of c ntral nervous syst m re w of l t ratur nd r port of 5 ca Ann Int Med 32 1153 1183 June 1950.

(6) Parr llo O J Dis minat d mycot c dis s eport of 3 cas s J A M. A 144 747 748, Oct 28 1950

(7) C k A W Cryptococcus (Torula) me i g tis report of 2 cases J A M. A 146 1105-1107 July 21 1951

(8) Pr zyna A P Cryptococcus n oformans meningo-encephal tis r port of fatal cas U S Armed Forc s M. J 1 866-873 Aug 1950

(9) How G W Atyp c l ca of men ngo-enc phal tis due to Cryptococcus n oformans (Torula histolytica) e ew of l t ratur South M J 43 649-651 July 1950

(10) F h A M. Clinical pictur associated with inf ctions due to Cryptococcus ne formans (Torula h t lyt ca) r port of 3 case with s me xperimental stud s Bull J hns H pkins Hosp 86 383 414 June 1950

(11) Robert o H C. J nd Mos l y V Cryptococ us mening tis port of ca e tth r val fte 14 m nths Ann Int Med 36 1538-1540, Jun 1952

(12) Cart C A Treatment of c ntral nervous ystem cryptococ osis r i w and port of 4 ca es tre t d with actidione Ann Int Med 37 123 154 July 1952

CASE REPORT

A 29-year old man was admitted to the Tokyo General Hospital on 8 April 1952 with chills fever sore throat and a bilateral temporal headache which had begun about 10 days previously His home was in the Territory of Hawaii and during World War II he had served in the Army in the United States the Philippines and Korea but he had been employed in Japan for 18 months In October 1950 he was treated at home with

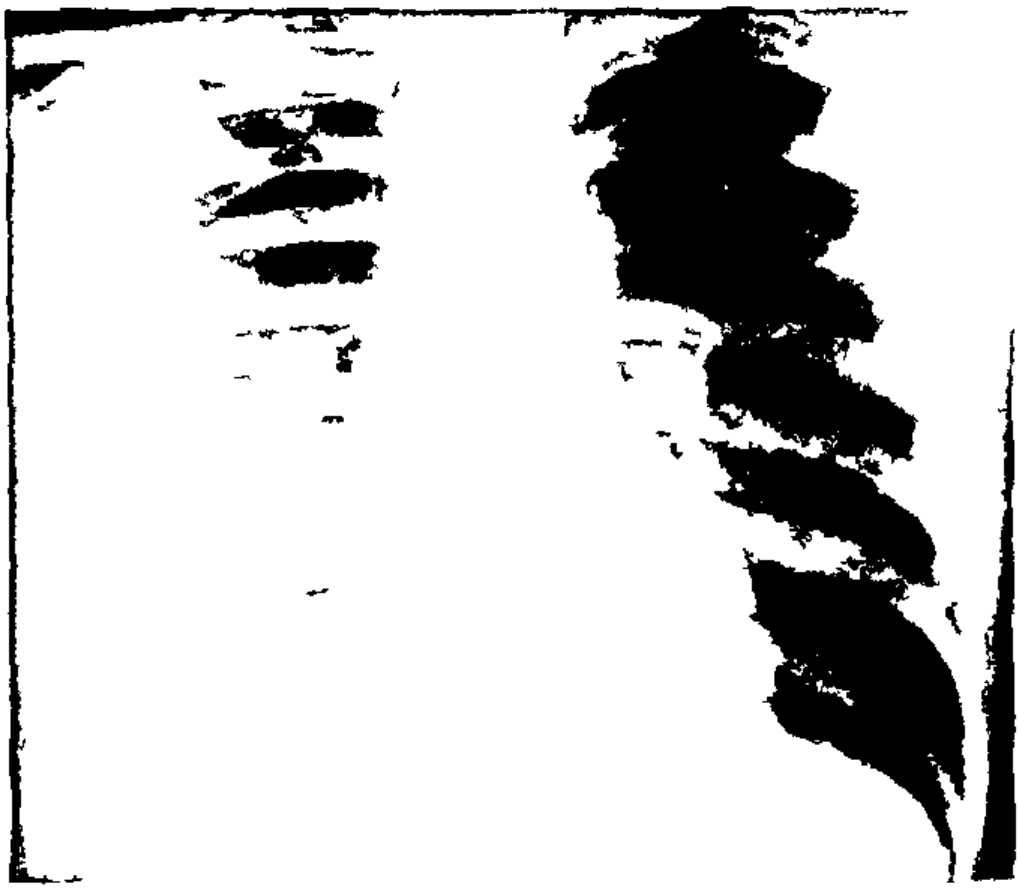


Figure 1

penicillin for a febrile illness diagnosed pneumonia Recovery was uneventful In May and June 1951 an idiopathic pleural effusion developed on the right side for which he was treated at a hospital in Tokyo with streptomycin and para aminosalicylic acid (PAS) for 2 months He returned to his job and was apparently free of symptoms until onset of his present illness

On admission he had a temperature of 102 8 F There was dullness to percussion and diminished breath sounds over the right lower half of his chest anteriorly and posteriorly The examination was otherwise negative

Initial therapy consisted of the usual supportive measures and injections of penicillin Because the patient did not respond immediately, aureomycin by mouth was substituted for the penicillin The patient continued to have a febrile peak daily but blood smears were repeatedly negative for malarial parasites On 12 April he began to complain of more severe headache, pain in the neck, nausea, and vomiting His neck was stiff and on 13 April a lumbar tap was performed The spinal fluid contained 354 cells per cu mm (280 polymorphonucleocytes and 74 lymphocytes), 772 mg of chloride per 100 cc , 70 mg of protein per 100 cc and 55 mg of sugar per 100 cc An EEG was con

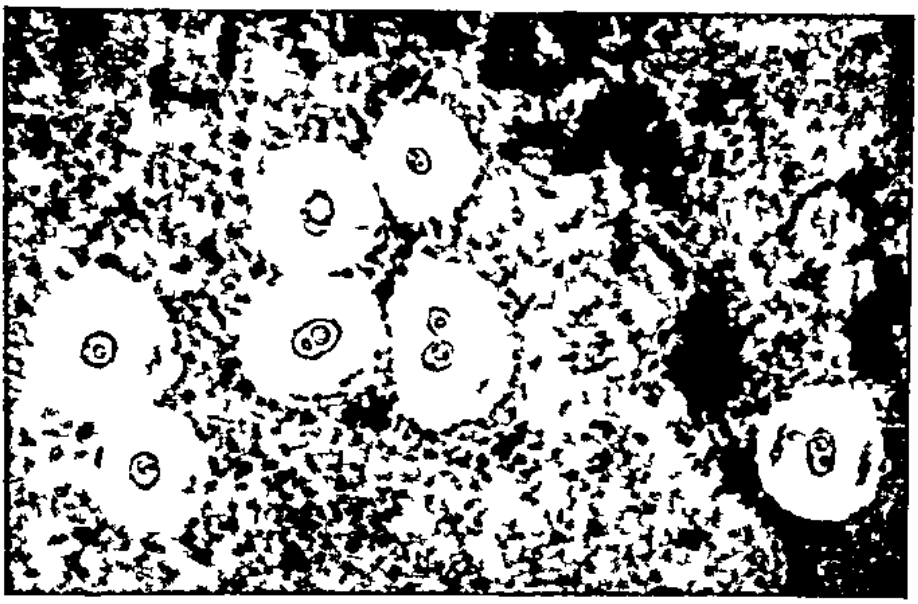


Figure 2 India ink preparation of the spinal fluid showing typical C. neoformans

sistent with a diagnosis of encephalitis A roentgenogram of the chest revealed a homogeneous pleural density on the right side, most marked in the lower portion (fig 1) Intramuscular injections of 1 gram of streptomycin twice daily and 12 grams of PAS daily by mouth were begun on 13 April because of the presumptive diagnosis of tuberculosis The patient s temperature was usually normal in the morning with elevation to about 102 F in the afternoon His spinal fluid on 16 April was essentially unchanged except for reduction of the sugar to 16 mg per 100 cc Sulfadiazine penicillin and aureomycin were added to the therapeutic regimen because of suspected pyogenic meningitis An india ink preparation of the spinal fluid taken on admission showed forms suggestive of fungus or yeast Another specimen taken on the same day was reported to contain acid fast bacilli Consequently a diagnosis of tuberculous meningitis was made all antibiotics except streptomycin and PAS were discontinued, and the patient was evacuated to this hospital for further treatment, arriving on 25 April

TABLE 1 Sp l flu d f nd g

Da	Cell (pe mm)		Tot l pr i (mg pe 100)	Suga (mg pe 100)	Chlorid N Cl (mg pe 100)	Cl b li (P ndy)	Sme	Pr ur (mm H_2O)	R ma ks
	P ly	Lymph							
13 Apr l	280	74	70	55 0	772	++			
1 Apr l	586	75	78	16 0	719	+++			
18 Apr l	1 010	70	64	16 0	710	++ +	? Y or f gus id fa t ba illi port d		Sp nal fl d W ma negati
25 Apr il	14	276	123	10 3	660	++++		Ov t 600	T f rr d Tr pl Army Hosp t l 50 mg f tr pt mycin ll d
27 Apr l	1 581	119	93	3 0	625	++	N met us Cryp- ococc i ne for ma (india k)	Ov 600	50 mg i pt my t ll d
29 Apr l			93	3 8	603	+ +	Cryp ococ us ne forma	Ov t 600	
30 Apr l	1 5 C	120	82	7 5	627		Cryptococ us neoformans	Ov 600	
5 May	558	42	188	0	613		Cryptococ us ne forma	Over 600	Fluid bl k i id nd ligh ly xa hoch r mi

l lymrogk uc l ocy
L w hocyt

On admission he appeared to be acutely ill His sensorium was clouded but he was able to talk His temperature was 100 4 F , his pulse was 80 and his blood pressure was 130/90 Positive Kernig and Brudzinski signs were elicited His pupils were equal and responded to light and accommodation Funduscopic examination revealed bilateral papilledema The chest examination was as noted earlier There was paravertebral muscle spasm A bilateral fourth nerve paralysis and a right seventh nerve paresis were observed Sensory and other motor functions appeared to be intact The knee jerks were equally hyperactive and there was a questionably positive Babinski sign bilaterally The remainder of the physical examination was negative The sedimentation rate was 22 mm per hour (Wintrobe) Cutaneous tests with histoplasmin and coccidioidin were negative, but a tuberculin test was positive The spinal fluid pressure on admission was over 600 mm of water The results of the laboratory examinations of the spinal fluid are shown in table 1

The intramuscular injections of streptomycin PAS by mouth, and daily intrathecal instillations of 50 mg of streptomycin were discontinued on 28 April when an india ink preparation of the spinal fluid revealed numerous encapsulated and budding fungi identified as *C neoformans* (fig 2) Subsequent india ink preparations of cerebrospinal fluid consistently revealed abundant organisms which were readily grown in pure culture on Sabouraud's medium Three grams of sulfadiazine were given at once followed by 1 gram every 4 hours with equal amounts of sodium bicarbonate This dosage of sulfadiazine and 600 000 units of procaine penicillin intramuscularly every 4 hours was continued until the patient s death On 2 May 1 gram of terramycin was given by mouth every 4 hours and this dosage was also continued until the patient died Spinal punctures were performed every other day to relieve the spinal fluid pressure which consistently ranged over 600 mm of water, but despite all therapy the patient s course continued to be septic *C neoformans* were recovered from his sputum on several occasions but all acid fast smears of spinal fluid and sputum at this hospital were negative for *Mycobacterium tuberculosis* By 3 May the patient was disoriented A brief lucid interval usually occurred after lumbar punctures By 11 May he became comatose, but adequate intake of food and liquids was accomplished by tube feeding His coma deepened, his respirations became shallower he became incontinent of urine, and he died on 16 May

Autopsy findings There were dense adhesions between the right lobe of the liver, the diaphragm, and the peritoneum A loculus containing gray, thick, purulent material was present between the greater omentum and the superior and inferior aspects of the right lobe of the liver The right pleural cavity was

completely obliterated by thick, firm, fibrous adhesions The pericardial cavity contained a small amount of clear amber fluid

The right lung weighed 410 grams and the left lung 350 grams The parenchyma of the left lung was grossly normal except for numerous miliary, gray subpleural nodules over the anterior aspect of the inferior portion of the upper lobe The right lung was encased in a thick fibrous shell The parenchyma throughout showed a decrease in crepitus At the anteroinferior margin of the right lower lobe there was a smooth gray sharply circumscribed area of induration measuring 2 by 1 5 by 1 5 cm A section of this area revealed it to be partially encapsulated by a zone of dense fibrous tissue Within this area the alveolar structures had been completely destroyed and replaced by inflammatory tissue The bronchi were well preserved Within part of the nodule there was a dense infiltration of varying sized lipoid laden macrophages Within this area only an occasional small collection of fungal organisms could be identified Throughout the remainder of the nodule there was a loose network of fibroblastic cells with a diffuse heavy distribution of fungal organisms Sections of the remaining portions of the lungs showed varying degrees of inflammatory change For the most part the bronchi were filled with purulent exudate and in many instances the exudate formed small poorly circumscribed abscess cavities The pleura at the site of the area of induration showed nonspecific fibrous thickening At other sites the pleura showed extensive necrosis which was demarcated from pliable fibrous tissue by a zone of lymphocytic infiltration No organisms were found in the pleural sections

At some hepatic sites there was nonspecific fibrous thickening of the capsule The abscess described grossly had a thick fibrous tissue wall The lumen contained amorphous eosinophilic material At the junction between the contents and the fibrous capsule there was a zone of chronic inflammation manifested by a dense infiltrate of lymphocytes scattered throughout which there were lipoid laden macrophages and an occasional foreign body type of giant cell No organisms were identified

Within the medulla of one of the sections of adrenal gland there was an irregular zone of caseous necrosis surrounded by a thin rim of lymphocytes No organisms were identified

Exudate was present in the subarachnoid space of the brain being particularly prominent over the dorsal aspect of the cerebellar hemispheres Over the cerebral hemispheres the exudate tended to follow the course of the blood vessels Within the white matter and basal ganglia of the cerebrum there were multiple small cystic structures up to 0 4 cm in diameter Micro-

scopic sections showed that in all sections of the superficial aspect of the brain and spinal cord, the subarachnoid space contained innumerable yeast bodies There was extensive fibroblastic proliferation and a diffuse infiltrate of inflammatory cells consisting predominantly of polymorphonucleocytes An occasional foreign body type of giant cell was identified A section of choroid plexus showed extensive chronic inflammation within which many organisms were identified Most of the cystic structures described grossly were sharply punched out and had no demonstrable lining There was no inflammatory reaction in the adjacent brain and no identifiable material within the lumens In no instance could organisms be found within a cyst

DISCUSSION

The history of an inadequately treated idiopathic pleurisy preceding the present illness by 11 months, the pulmonary and meningeal symptoms, the reported finding of acid fast bacilli in the spinal fluid, and other spinal fluid findings made the diagnosis of tuberculous meningitis seem most probable Only the fortunate circumstance of making india ink preparations of the spinal fluid led to establishing the correct diagnosis prior to the patient's death The pathologist was unable to find any evidence of active tuberculosis post mortem

A careful review of the various manifestations of cryptococcosis of the central nervous system was made by Mosberg and Arnold *(5)*. They mentioned only one patient with early pleural involvement and only one other patient in whom pleural reaction occurred as a terminal event It is believed that the patient here reported is the first to have a clinical onset with an exudative and fibrotic pleural reaction

Of the 189 patients with cryptococcosis of the central nervous system reported, 14 were still alive at the time of their respective reports Carton *(12)* analyzed these 14 case reports and concluded that only 1 patient (reported by Marshall and Teed *(13)*) could be considered cured because follow up data of the others was either inadequate, the patient had subsequently died or the patient continued to manifest persistent pleocytosis or positive cultures in the cerebrospinal fluid The patient considered cured was treated with sulfadiazine

A wide variety of therapeutic agents, including iodides, vaccines, nonspecific fever, various heavy metals, and antibiotics, have been tried by various observers Most recently Carton has reported 4 patients treated with actidione with encouraging re

(13) Marshall M. and Teed R. W. Torula histolytica meningoencephalitis recovery following bilateral lumbar toracotomy and sulfonamide therapy preliminary report J A M A 120: 527 529 Oct 17 1942

sults Penicillin was given to our patients because of its reported action against *C neoformans* in vitro although the clinical experience of others was discouraging It was decided to try terramycin because some indication of fungicidal action of terramycin was established by Pulaski *(14)* who noted a good response in 2 patients with cervical actinomycosis

SUMMARY

The clinical course and laboratory findings in a patient with cryptococcosis strongly suggested tuberculosis The correct diagnosis was established 18 days ante mortem by demonstrating *C neoformans* in the spinal fluid It is believed that this is the first reported patient in whom the onset of the disease was manifest only by exudative and fibrotic pleural reactions occurring 11 months prior to appearance of meningeal involvement Intensive therapy with terramycin in addition to other conventional therapy did not appear to influence the progressive downhill course of the disease The principal autopsy findings consisted of a diffuse leptomeningitis of the brain and spinal cord pulmonary parenchymal and pleural inflammatory lesions fibrous adhesions of the liver an extrahepatic abscess and a focus of necrotizing chronic inflammation in the adrenal medulla Organisms present in the lungs and subarachnoid space were considered to be *C neoformans* Organisms were not identified within the pleural cavity liver or adrenals but because of the histologic characteristics of the lesions they were considered to be of cryptococcal origin

(14) Pulaski E J Pleural effusion in fungus infection New York Acad Sc 53 347-361 Sept 15 1950

BOOKS RECEIVED

The Neurophysiological Basis of Mind The Principles of Neurophysiology by John Carew Eccles Fellow of Physiology The Australian National University Canberra Formerly Fellow of Magdalen College Oxford Hilary Term 1952 314 pp illustrated Oxford At the Clarendon Press London Oxford University Press 1953 Price $6 50

The Principles of Neurological Surgery by Lyal Davis M S M D Ph D D Sc (Hon) Professor of Surgery and Chairman of the Department of Surgery Northwestern University Medical School Chicago Illinois 4th edition thoroughly revised 544 pp 186 figures some in color 354 illustrations and 5 plates 1953 W B Saunders Company Philadelphia Publishers

AMEBIC GRANULOMA OF THE RECTUM SIMULATING CARCINOMA

KENNETH F ERNST *Colonel MC USA (1)*

ONE of the complications resulting from infection of the intestinal tract by *Endamoeba histolytica* is the development of a chronic hyperplastic process with or without abscess formation, now known as amebic granuloma or ameboma Molinier et al *(2)* reported 50 patients with proved amebiasis of whom 8 had amebomas That this process may cause radiologic deformities, anemia, loss of weight, and intestinal hemorrhage simulating a neoplastic process is known, but erroneous clinical diagnoses of neoplasm resulting in disastrous operations still occur This may be due to the failure sufficiently to emphasize this disease in the differential diagnosis of intestinal diseases

Although Banks *(3)* stated that granulomatous lesions of amebiasis are commonly seen in the rectum and Donoso Infante and Amenabar Castro *(4)* listed the rectum, cecum, and sigmoid in order of frequency, most case reports concerning this pathologic feature have dealt primarily with lesions of the cecum and secondarily with other areas of the large bowel exclusive of the rectum Exceptions were reported by Nevin *(5)*, Yeomans *(6)* and Donoso Infante and Amenabar Castro

The likelihood of confusing these lesions with carcinoma or the possibility of an intestinal obstruction resulting from them

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(1) Letterman Army Hospital San Francisco Calif at time of writing now at Walter Reed Army Hospital Washington, D C.

(2) Molinier A Benassude A and Tabusse L Les lesions rectales de la dysenterie amibienne Arch d. mal d l app dig tif 38 331 337 May-Jun 1949

(3) Banks R. W Amebiasis and amebic dysentery In Bockus H L et al Gastroenterology Volum II The Small and Large Intestine and Peritoneum W B Saunders Co Philadelphia P 1944 p 629

(4) Donoso Infante A and Amenabar Castro E Pseudotumores rectales de origen amebiano (granuloma amebiano) Rev med Chile 80 236-240 Apr 1952

(5) Nevin R W Amoebic granuloma Proc Roy Soc Med 42 769-774 Oct 1949

(6) Yeoman F C. Amebic granuloma simulating carcinoma of colon and rectum. Am. J Surg 31 365 Feb 1936

has been emphasized by Marsden *(7)* Reddy and Rangam *(8)* Yeomans, and Rudolph and Braudo *(9)* Donoso Infanto and Ameri bar Castro also stressed the possibility of a carcinoma bei mistaken for an ameboma and the possibility of the coexiste ce of both lesions Why some patients should develop granulomatous hyperplastic lesions is unknown but they suggested the possi bility that different strains of *E histolytica* or acquired immunity in a population might influence the type of lesion which develops

Because amebic granuloma should be considered in the differ ential diagnosis of obstructive or deforming lesions of the large bowel and because if neglected there is the possibility of serious diagnostic error a case of amebic granuloma of the rectum is reported

CASE REPORT

A 30 year-old Negro was admitted to Letterman Army Hospital by transfer from another hospital on 1 July with abdominal pain as his chief complaint He had lived in California all his life Abdominal pain and distention especially after eating greasy foods had been present since mid May The pain lasted for se veral hours at a time and was occasionally relieved by catharsis or the use of sodium bicarbonate An exacerbation of this pain predominantly in the upper part of the abdomen recurred several weeks later after a large evening meal The patient was hospital ized on 21 June and a diagnosis of tumor of the rectum was made During this initial period of hospitalization his temperature varied between 99 and 101 F his leukocyte count, from 8 400 to 14 000 with from 70 to 86 percent neutrophils On 2 occasions the eosinophil count was 7 percent During this hospitaliza tion a Frei test was negative A stool examination for para sites and ova was ordered but apparently was not done as the results were not reported

On transfer to this hospital he had lost 40 pounds and had vague abdominal tenderness, but no mass was palpable through the abdominal wall Rectal examination disclosed a firm mass posteriorly on the right about the size of a lemon which seemed to involve the wall of the rectum On admission his temperature was normal his erythrocyte count was 4 7 million his leuko cyte count was 11 300 with 68 percent neutrophils and 6 per cent eosinophils and his hemoglobin was 1 . During this ho pitalization his temperature varied up to a maximum of 100 F

(7) Ma sd C. M. A oeboma or ca ma (m? J Roy A my M. Corp 88: 39-41 J 1947

(8) Reddy D G ad Ra g m C M Amoeb gra l ma (moeboma) f l s in ne Indi M G 81 463-466 N 1946

(9) Rud lph A M ad B ud J L. Amoeboma of la g bow l w h review f l ter ure Clin P oc 6 87 91 Sep 1947



Figure 1 Barium enema showing filling defect of rectum.

his leukocyte count ranged up to 20,900 with 83 percent neutrophils and his hemoglobin dropped to 7 after the onset of the intestinal hemorrhage which characterized the terminal stages of his illness A barium enema revealed a constant filling defect encircling the upper half of the rectum (figs 1 and 2) The greatest



Figure 2 *Filling defect and irregularity in wall of rectum after partial evacuation.*

defect appeared on the right, displacing the rectal lumen slightly to the left The remainder of the colon and a subsequent gastrointestinal series was normal During proctoscopy an obstructio which could be bypassed on the left was encountered 5 cm above the anal orifice and a mass about 6 cm in diameter which was apparently in the rectal wall, was described The mucosa of the rectum was normal except for mild congestion over the mass \o ulceration was observed and following proctoscopy purulent material drained freely from the rectum The size of the mass decreased subsequent to drainage but induration of the tiss es remained Smear and culture of the purulent material yielded



Figur 3 Ma gin of Ice (H & E stai X 37)

Escherichia coli Micrococcus pyogenes var *albus* and nonhemolytic streptococcus Examination of this material for parasites and ova was not requested and was not done No specimen for biopsy was taken during this procedure On the same day cystoscopic examination showed a bulging in the region of the trigo e of the urinary bladder about 1 . cm in diameter, but the over lying mucosa was uninvolved

On 23 July an exploratory laparotomy was performed The organs in the pelvis were an adherent mass This mass extended from the posterior surface of the urinary bladder to the sacral promontory and the lower sigmoid went directly into it Biopsy was impossible \o lymph glands were palpable alon the aorta and there were no peritoneal tumor implants A sigmoid colo tomy was performed and division of the colostomy loop was comple ed on 4 \ugust.

During the first postoperative week the patient began to pass small amounts of blood through the colostomy and by rectum, and in the latter part of August had several massive hemorrhages



Figure 4 Trophozoite of E histolytica (H & E stain, X 1 800)

from the rectum His erythrocyte count dropped to 2 11 million with 7 grams of hemoglobin and he died during a massive hemorrhage on 4 September

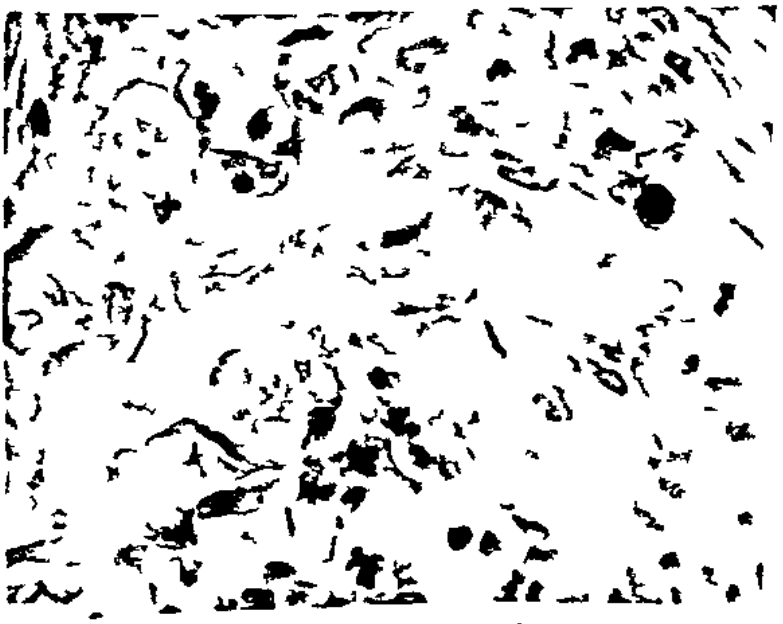


Figure 5 Colonization of E h stolytica in wall of rectum (H & E sta n, X 475)

At autopsy the body weighed 80 pounds Pressure on the abdomen caused dark red fluid to exude from the colostomy opening The pelvic peritoneal cavity was the site of an old organizing

peritonitis and the omentum was adherent to the abdominal wall about the colostomy The rectum was adherent to the bladder and the descending colon to the dome of the bladder over an area about 5 cm in diameter and formed the roof of a localized abscess which filled the pouch of Douglas extended into the pelvic retroperitoneal tissue, and communicated with the lumen of the descending colon through the upper portion of a mucosal ulcer This ulcer was on the anterior surface of the bowel and proximal to the bulging indurated area noted at proctoscopy (fig 3) It began about 6 cm from the anal orifice measured 7 cm in diameter and undermined the rectosigmoidal mucosa Scrapings from the margin of this ulcer revealed trophozoites of *E histolytica* and microscopic examination of the bowel showed colonizatio by the same organisms (figs 4 and 5) The wall of the bowel was fibrosed and thickened (fig 6)



F gu 6. Fibrous thi k i g of ctal all (H & E i i X 37)

COMMENT

Deep involvement of the bowel wall by *E histolytica* occurs presumably by lytic action on the mucosa After penetrating this structure the organisms commonly advance laterally destroying the submucosa as they advance and produce a water bottle ulcer with narrow opening and a broad submucosal cavity This feature in another case from the files of the Armed Forces Institute of Pathology is illustrated in figure 7 No lesion is produced unle s active colonization of the *E histolytica* occurs (10). These features in part were present in this case of amebic granuloma of the rectum which came to autopsy with a clinical diagnosis of carcinoma This case emphasizes the importance of

(10) A h J E a S u S P h l gy (T p I D W B Saunder Co Ph T lphia P 1945 p 80

considering the possibility of an inflammatory process in the diagnosis of obstructive, deforming lesions of the bowel It is doubtful that an inflammatory disease was seriously considered in this case because no examination of feces for parasites and ova was recorded Even had the purulent material, which drained after proctoscopy, been examined for amebas, it is doubtful that they could have been identified in the necrotic debris Failure to demonstrate the causative organism by examination of feces or material from abscesses and fistulas is not infrequent and Rudolph and Braudo stressed the diagnostic value of a therapeutic response to emetine in obscure cases Gunn and Howard *(11)* emphasized the necessity for examination of material from the base and edges of ulcers where organisms are most numerous



Figure 7 Typical water bottle ulcer

The past history, the complaints, and some of the clinical findings or lack of them in this case contained little to suggest an amebic infection According to Nevin most patients with intestinal amebiasis do not have an associated dysentery so this symptom should not be used as a prime criterion in the diagnosis

In retrospect, the elevated leukocyte count with a high per cent of neutrophils and the febrile reaction perhaps should have suggested an inflammatory process The significance of the slightly elevated eosinophil count is not known It is possible that the ulcer of the rectum noted at autopsy was present at the time of proctoscopy but that it was not seen because of its location above and behind the elevated and indurated mass impinging on the lumen of the bowel

(11) Gunn H ad Howa d N J Am b c gran loma of large bowel the r cl nic l resemblanc to ca cinoma J A M A 97 166-170 J ly 18 1931

BOOK REVIEW

Cl nical P odont l gy Th P riod t um n He lth d D R g n tion D g o s d Tr tm t of P riodo t l D e in th Practi of G n ral D nti try by *Irving Gl ckman,* B S D M D F A C D P fe so of Oral P th l gy d P riod ology a d D re t r of t D on of Graduat d Po tgraduate Stud T ft Coll ge De tal S hool A oci te Staff (Stomat l gy) N w E gla d Ce t r Hosp tal Co ult nt Pe odo t l gy Forsyth D ntal Infirmary for Ch ldren L cturer Oral P thol gy Bo ton U ity School of M d i B to Ma 1 019 pag ill trated W B Saund r Co Ph la d lph P p bl h r 1953

This book is one of the most informative texts of the known aspects of periodontal disease that has been published to date It is divided into 3 sections (1) tissues of the periodontium devoted to a discussion of the tissues which make up the peri odontium namely the periodontal membrane the gingiva cemen tum and the alveolar bone (2) periodontal disease in which the various diseases to which the periodontium is subjected to gether with their etiology and classification are discussed and (3) clinical management of periodontal disease, which in cludes the diagnosis prognosis and treatment of periodontal disease

This division will prove helpful to readers who are using the text as reference for a particular subject in the field of periodon tology or oral pathology The author does not favor any one particular operative technic for the eradication of the periodontal but thoroughly discusses all of the accepted technics that are used today

The text is well illustrated with black and white photographs and diagrams This book should prove to be of great value to both the practitioner and student in the field of periodontology and especially so to those who are concerned with the histo pathologic changes that constitute periodontal disease

—Capt T D Pryse USAFR (DC)

METAPHYSIAL ACLASIS[1]

THOMAS B DAMERON Jr *Lieutenant, MC USNR*

WILLIAM H GULLEDGE *Commander MC USN*

METAPHYSIAL aclasis is a hereditary abnormality of osseous development It is often confused with other bone diseases because of the diversity of anomalies It is characterized by osteocartilaginous exostoses varying in number from one to several hundred and by characteristic skeletal deformities *(2)* It is classified under a variety of names among which are hereditary deforming dyschondroplasia *(3)* multiple congenital exostoses, chondrodysplasia, hereditary multiple exostoses *(4 5)*, multiple cartilaginous exostoses, diaphysial aclasis, and metaphysial aclasis We believe that the term metaphysial aclasis most accurately describes the location and the nature of the condition

The characteristic deformities have been observed on the skeletons of dinosaurs and men from the Stone Age It was first described in 1861 by Virchow as exostosis multiple cartilaginea *(6)* The hereditary developmental deforming tendency is transmitted as a Mendelian recessive characteristic affecting males predominantly The most acceptable theory as to pathogenesis is that the deformities result from a disarrangement of the epiphysial cartilaginous plates and a deficiency of the ring of metaphysial periosteum *(7)* The former causes bone to grow out at an angle from the normal contour of the bone, forming exostoses The latter causes a failure of the modeling process of the metaphysis resulting in the entire unmodeled metaphysis being the same width as the diameter of the epiphyseal line

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(1) U S. Naval Hospital Bainbridge Md.

(2) Stocks P Heredity Disorder of Bone Development Part I Diaphysial Aclasis (Multiple Exostoses) Multiple Enchondromata Cleido-Cranial Dysostosis With the assistance of Amy Barrington The Treasury of Human Inheritance edited by Karl Pearson Vol 3 Function Galton Laboratory for National Eugenics Eugenics Laboratory Memoirs 22 Cambridge University Press New York, N Y 1925

(3) Ehrenfried A H reditary deforming chondrodysplasia —multiple cartilaginous exostoses review of American literature and report of 12 cases J A M A 68 502-508 Feb 1917

(4) Jaffe H L Hereditary multiple exostoses Arch Path 36 335 357 Oct 1943

(5) Stark, J D Adler N N and Robinson W H Hereditary multiple exostoses J Radiology 59 212-215 Aug 1952

(6) Virchow R Die Krankhaften Geschwulste Verlag Von August Hirschwald Berlin Germany 1864 1865 p 83

(7) Fairbank, H A T Diaphysial aclasis synonyms multiple exostosis hereditary deforming chondrodysplasia J Bone & Joint Surg 31 B 105-113 Feb 1949

Because the deformities result from abnormal cevelo[illegible] exostoses *stop progressing in size* when the bones [illegible] Any growth of a lesion after normal bone growth ha[illegible] be suspected as a malignancy As would be expected, the le[illegible] are most frequent where bone growth is normally greate[illegible] formed in membrane is not affected *(8)* The epiphyses are [illegible] involved

Roentgenographic appearance Individual exo to e [illegible] broad bases fused with the parent bone without a line of demar[illegible] tion. *The apex of the lesion points toward the center of the e*[illegible] physis There is a broadening of the metaphysis and adja[illegible] diaphysis in the region of the exostosis *In addition to the e*[illegible]

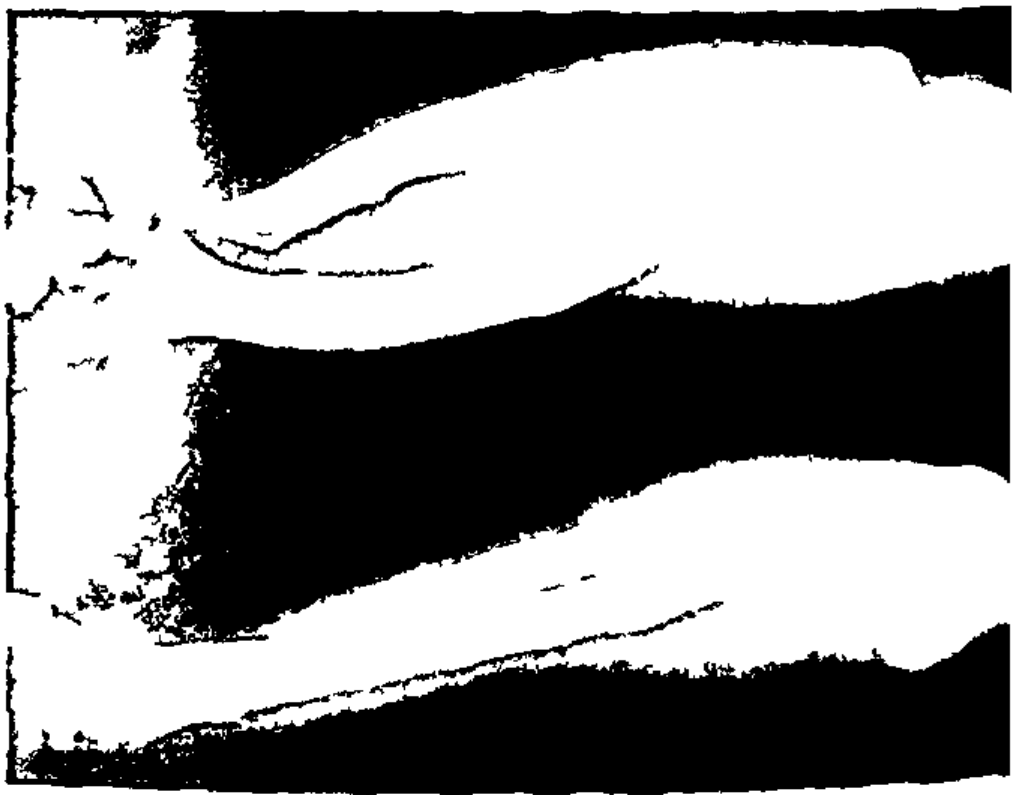


Figure 1 Bowing of ad[illegible] and bori[illegible]

tiple exostoses and metaphysial deformities there is frequently shortening of the ulna and sometimes a bowing of the radi[illegible] (fig 1) Dislocation of the radial head occurs less often about 20 percent of the patients there is a shortening of t[illegible] fibulas and genu valgum Those affected are usually shorter stature than their unaffected siblings Seventy five percent of t[illegible] lesions are relatively symmetrical The exostosis cannot differentiated from the underlying bone microscopically T[illegible] size of the overlying cartilaginous caps diminishes as the exost[illegible]

(8) K[illegible] f[illegible] m[illegible] ha[illegible] wh[illegible] [illegible] y [illegible] f human body Am J Anat 54 101 115 Ja[illegible] 1930

sis matures *(9)* There is no evidence of the lesions being neo plastic except in the rare incidences of malignant degenerations

The condition is most frequently confused with dyschondro plasia Because there is no cross inheritance of the 2 develop mental abnormalities, we can be sure that they are different

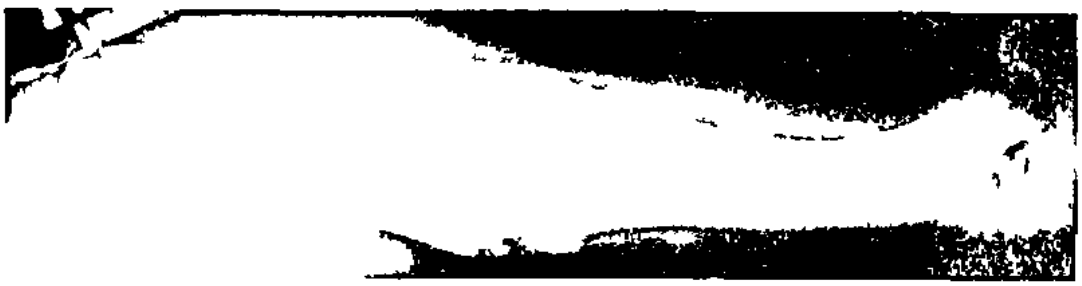


Figure 2. Typical appearance of humerus

Metaphysial aclasis results in outgrowths from the surface of the parent bone, whereas, chondrodysplasia results in masses of the cartilage being displaced inside the affected bone There is little alteration of the outer contour in dyschondroplasia and there is a predilection for the phalanges and sternum Metaphysial aclasis



Figure 3. Broadening of femoral neck and trochanteric areas Exostoses can also be seen on ilium ischium, and pubis

(9) Gebhardt, C. F., and Copeland, M. M.: Tumors of Bone, 3d edition, J. B. Lippincott Co., Philadelphia, Pa., 1949, pp. 79-87

Because the deformities result from abnormal development, the exostoses stop progressing in size when the bones stop growing. Any growth of a lesion after normal bone growth has stopped must be suspected as a malignancy As would be expected, the lesions are most frequent where bone growth is normally greatest. Bone formed in membrane is not affected *(8)* The epiphyses are never involved

Roentgenographic appearance Individual exostoses have broad bases fused with the parent bone without a line of demarcation. The apex of the lesion points toward the center of the diaphysis There is a broadening of the metaphysis and adjacent diaphysis in the region of the exostosis In addition to the mul-



Figure 1 Bowing of radius and shortening of ulna

tiple exostoses and metaphysial deformities there is frequently *shortening* of the ulna and sometimes a *bowing of the radius* (fig 1) Dislocation of the radial head occurs less often In about 20 percent of the patients there is a shortening of the fibulas and genu valgum Those affected are usually shorter in stature than their unaffected siblings Seventy five percent of the lesions are relatively symmetrical The exostosis cannot be differentiated from the underlying bone microscopically The size of the overlying cartilaginous caps diminishes as the exo-

(8) K h A. Stud f na m l ha g wh h ape y erta g wh-d w-r f hma body Am. J Ana 54 101 115 J a. 1920

CASE REPORTS

Case 1 A 17 year old man was found at the age of 2 years to have "bunches" on his extremities These increased in size until the patient was 15 years old He had had no therapy and had no symptoms prior to entry into the service Since being in the service he had not been able to perform his duties because of



Figure 5 Deformity at ankle joint showing widening of metaphyses exostoses and tibial torsion

n in his shoulders and feet. There was no family history of letal abnormalities Examination revealed relatively sym l hard masses up to 8 cm in diameter over the ends of all he long bones scapulas (fig 6) and phalanges There was a full of joint motion except for the right elbow which had a 20° of extension.

Case 2 A 20 year-old man was found at the age of 10 years have lumps" on his bones These increased in size until he as 15 years old. There had been no change in size of any of the since that time Three of the masses were removed when e was 16 years old and the pathologist reported no malignancy he patient has been asymptomatic He was referred to us for aluation as to his suitability for the military service There as no family history of skeletal abnormalities Examina

revealed masses from 1 to 4 cm in diameter over the ends of the long bones and scapulas There was a full range of motion in all joints except for limitation of knee flexion to 80

Case 3 A 17 year old man was found at the age of 5 years to have knots on his bones These grew in size until he was 16 years old There had been no growth of any of the masses since The patient was unable to stand or walk for prolonged periods because of the pain in his feet and ankles His only sibling a brother and a nephew were similarly affected No other known skeletal abnormality was present in the family Examination showed palpable bony masses varying from 0 3 to 3 cm in di



Figure 6. Bony masses on plantar aspect

ameter over the second lumbar spinous process ilium clavicles scapulas ribs and long bones

Comment All 3 of these recruits were separated from the service because of their symptoms and findings Figure 1 to 6 show typical changes in the involved areas

SUMMARY

Metaphysial aclasis is a hereditary developmental disorder of the bones The lesions are *not* true bone tumors The disease is characterized by multiple exostoses in the metaphysial regions and a general widening of the metaphysis Malignant degeneration must be expected when any of the bony lesions continues to grow after the patient has stopped growing

LARGE CALIBER MISSILE WOUND OF THE HEART[1]

ARTHUR R NELSON *Lieutenant MC USNR*

JOSEPH J ZUSKA *Commander MC USN*

FROM the first reported successful suture of a traumatic wound of the heart by Rehn in 1896 (2) to the recent years of rapidly advancing knowledge in the field of cardiovascular surgery, it has become apparent that wounds of the heart are no longer surgical rarities (3-5) The case here reported is of special interest only in that the heart wound was produced by a large caliber missile at close range, was not exsanguinating despite large rents in the left ventricle, and emphasizes the necessity for clinical suspicion of heart damage even in the absence of the classic signs of tamponade

CASE REPORT

A 28 year old sailor was admitted to the hospital at 0430 on 8 January 1953, having accidentally shot himself with a 45 caliber service automatic about 30 minutes prior to admission The force of the missile had thrown the patient from the deck of his ship into the waters of the dockyard where he was on duty He was pulled aboard and rushed to the hospital Examination revealed the patient to be in extreme respiratory distress with pallid cyanosis grunting dyspnea, a blood pressure of 70/40 and a pulse of 130 There was a circular wound of entrance 2 cm in diameter in the fourth interspace 5 cm to the left of the midsternal line from which bright blood was streaming A smaller circular wound of exit in the left third interspace 7 cm from the vertebral spines, was whistling air during the inspiratory phase Subcutaneous emphysema was present over the anterior surface of the left side of the chest and extended into the neck, which made estimate of the tracheal position indeterminate A left thoracentesis in the anterior axillary line was performed immediately and

(1) U S N val H p t l Key W t Fl

(2) R hn C t d n Gr w ld R A a d Magur C H Pe trat g w und f h r a d p r ca d m. Surg Gyn c & Obst 74 406-418, F b (C o 2A) 1942

(3) B gg I A He t wound po t of 17 patu t op rat d upon n Medical C l leg f \ g ni h p t ls nd di uss n f tr tm nt d p g s J Tho t Surg 8. 239-253 F b 1939

(4) Bl l k A d Ra h, M. M. Co d r tu f n nop ra v t eatm t f cardiac tamponad ult ng f om w und f h t Surg ry 14 157 162 Aug 1943

(5) Elk n D C \ cular i jur of wa fa Ann Surg 120 284-310 Sept. 1944

air under high tension was found in the pleural cavity The needle was fixed to the chest wall and attached to a makeshift under water seal drainage This resulted in rapid improvement in the respiratory distress Dextran solution was given intravenously followed shortly by type O blood with Witebsky substance Further examination of the chest disclosed no apparent evidence of tamponade but in view of the projected path of the missile and the evidences of shock and forceful bleeding from within the chest wound, preparation for thoracotomy was begun Two pints of blood were given and the blood pressure at the onset of the operation was 1°0/100 the pulse was 1°0

Under endotracheal ether and oxygen anesthesia the left side of the chest was opened through an anterior fourth interspace in

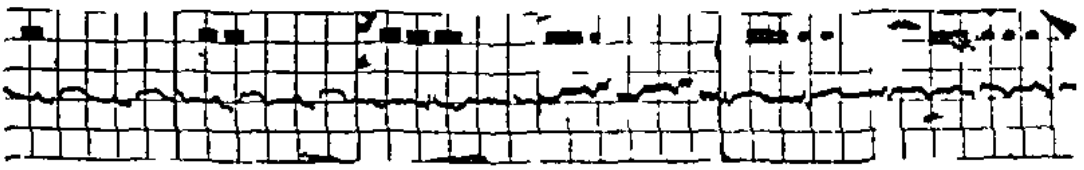


Figu 1 Roe tg ogram of ch st tak cond p h op rat day

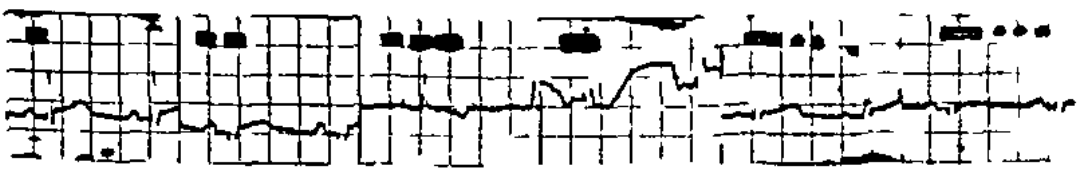
cision extending from the sternum to the anterior axillary line The left pleural cavity was found to contain about 750 cc of blood The pericardium appeared blue and was incised longitudinally exposing a 3- by ° cm wound in the anterolateral surface of the left ventricle about 1 cm below the circumflex coronary vessels The edges of the wound were bleeding moderately About °00 cc of blood lay in the pericardial cavity A No 0000 silk mattress suture was placed in an attempt to approximate the wound edges This apparently disturbed a clot within the ventricular wound and resulted in the onset of massive hemorrhage from the ventricular cavity A finger was placed across the wound to control the hemorrhage while several mattress sutures of No 00 silk were placed and tied effectively closing the wound On further inspection of the heart a circular wound of exit was noted in the posterior proximal portion of the left ventricle but

was small, firmly approximated, and not bleeding. This wound was not sutured. The pericardium was loosely closed with No. 0000 silk, gaps being left at both extremities of the closure for adequate drainage of the cavity.

The left lung contained a circular wound of entry 1.5 cm. in diameter in the anteromedial portion of the left upper lobe, and a similar wound of exit in the posterior midportion of that lobe. The



10 JAN 1953—SECOND POSTOPERATIVE DAY



14 JAN 1953—SIXTH POSTOPERATIVE DAY



23 JAN 1953—FIFTEENTH POSTOPERATIVE DAY



17 FEB 1953—FORTIETH POSTOPERATIVE DAY

Figure 2. *Serial ECGs recorded postoperatively indicating progressive infarction pattern. Inverted T waves in leads I, II and III with upright T waves in V_1 and V_2 and again inverted in III and VI in the stabilized pattern (fortieth day) indicated an old lateral infarction pattern.*

area between was solidified with clotted blood. Both pulmonary rents were closed with single mattress sutures of No. 00 chromic catgut. A stab wound was made in the dependent portion of the left side of the chest and a mushroom catheter inserted for underwater seal suction drainage of the pleural space. The wounds of

entrance and exit in the chest wall were excised and the thoracic incision closed in layers with fine silk

At the end of the operation the patient's blood pressure was 100/70 and he appeared to be in good condition Oxygen antibiotics chest drainage a tetanus toxoid booster and trivalent gas gangrene antitoxin were administered For the first several postoperative hours the patient blew air via the drainage system and the subcutaneous emphysema increased to involve the whole of the left side of the thorax neck and face but this soon ceased and the emphysema progressively resolved

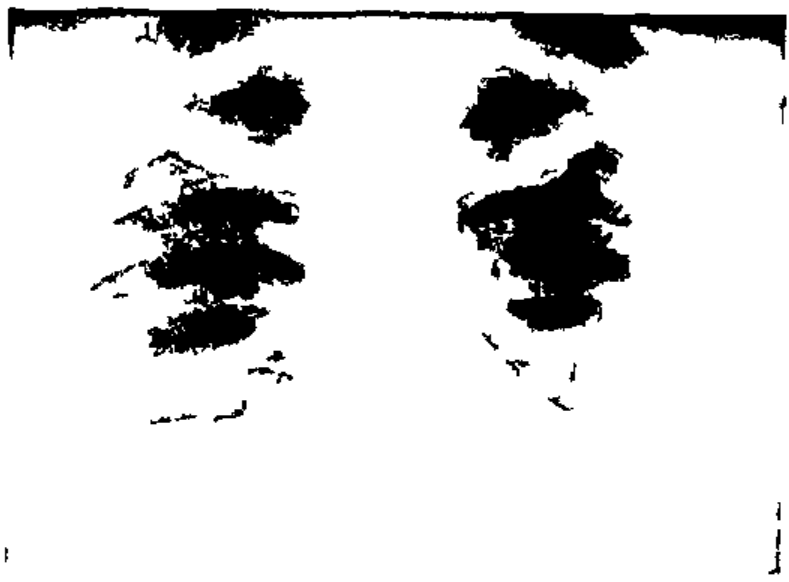


Fig 3. Roentgenogram of the chest taken the first postoperative day There were moderate pleural adhesions on the left.

About 15 hours postoperatively the patient became suddenly dyspneic and slightly cyanotic A roentgenogram of the chest disclosed atelectasis of the right upper lobe and an area of increased density in the left upper lobe which was interpreted as the area of infarction produced by the missile Bronchoscopy was done at the bedside and about 60 cc of thick bloody mucus was aspirated from the right main bronchus resulting in immediate improvement (fig 1) Further bronchoscopy was required twice a day for the following 2 days each time with dramatic relief of respiratory distress Roentgenograms of the chest showed progressive clearing of the atelectatic areas Steady improvement of the patient and effective coughing had ameliorated the problem of bronchial secretions by the fourth day During that time the patient's temperature had intermittently reached 102 6 F From that time there was steady improvement until by the tenth day he was afebrile free of cough jocular and eating well The thoracic wound healed satisfactorily Chest films showed progressive clearing of the area of infarction in the left upper lobe

Serial ECG's taken from the first postoperative day showed an interesting pattern of slowly progressive lateral infarction This had stabilized by the fourth week, but it is expected that electrocardiographic evidence of damage will persist indefinitely (fig 2) The patient was returned to full duty after 10 weeks' convalescence (figs 3 and 4)

DISCUSSION

The successful outcome of this case emphasizes several points that even large wounds of the ventricular cavities are not necessarily exsanguinating that tamponade will be self limiting



Figure 4. Photograph taken postoperatively showing healed anterior thoracotomy scar and site of pleural drainage.

when the pericardial rent is of adequate size to allow for drainage into the pleural space that a high index of suspicion should be maintained when dealing with wounds of the chest, and exploration carried out when the type of wound and its location suggest possible severe cardiac damage, even though none of the signs of tamponade are apparent. It should be mentioned of course, that a very happy combination of circumstances which allow these patients to be rapidly transported to adequate hospital facilities is of paramount importance

BOOK REVIEWS

Th Gra Block S bst tut on Te t f Measur g Org c Bra n P th l gy by *J pb R G* A B M A D r t f Cl l P ychol gy As stant Profes or of Cl nical P ych l gy Bowma Gray School f M d c W k For st Coll ge W t n-Sal m N C. Ame ca L c tur Seri P bl cation N mber 149 A M graph in Am Le tu e in P y h l gy d t d by *W lly H rrow* Ph D R ch d Consult g P y h l g t New Yo k N Y 75 pages Il rated Ch l C Thoma P bl h Spr gf ld Ill 1953 Pr ce $3

This manual describes the development and application of a clinical aid for the early diagnosis of organic brain pathology It is an extension of the theory and practice inherent in the better known Goldstein Scheerer Cube Tests Unfortunately the details of standardization are not presented with sufficient care to permit rigorous psychometric scrutiny Although alleging that interpretations become more valid with experience the author himself distrusts the test score in the absence of other indexes of behavior and a knowledge of intellectual level While the Grassi test may eventually be proved reliable and valid for the purpose intended this reviewer feels that the present publi cation is premature —*Maj R B Payne USAF (MSC)*

D of th D gestu e Sy m d d by *Sidney A Port* B S M D F A C P A oc t Cl cal P f of M d U ty f Illin s M d l School Se or Att d ng Phy ia h D partme f M d M h l R Hosp tal Cons l g Phy c Cook Cou y H p l Membe of Ad ory Boa d of I t t f P y ho naly Ch f f the M d cal Serv c f h I t e for P ycho orma c d P y h tr R h d Tra g M ha l R Hos p l Ch cago Ill w th 57 Co t butor 3d d t o th oughly re d 1119 page 269 gra g d 5 lor pl t Le & F b ger Ph lad lph P publ h 1953 P c $20

In this excellent and well organized textbook the anatomy physiology and diseases of the digestive system are compre hensively described and discussed Special attention is given to psychosomatic disturbances related to the gastrointestinal tract and to the more recently developed knowledge and treatment of ga trointestinal diseases

This volume is larger than previous editions because of added material and fuller coverage of subject matter The chapters have been rearranged and 8 new chapters have been added with much advantage to the reader for ready reference This book is of value to the gastroenterologist especially to the teacher in this specialty the general practitioner and the student desirous of making a complete tudy of di eases of the digestive sy tem —*Col P I McShane MC USA*

heart was not beating The myocardial pulsations recurred after the first initial compressions Meanwhile respirations were maintained by the use of the anesthesia machine The patient had not been intubated The peripheral pulse became palpable with the initiation of regular heart beats No attempt was made to use sterile technic for the thoracotomy but for the closure fresh drapes gowns and gloves were used A rubber catheter was inserted into the pleural cavity before the closure was begun When the closure was almost completed the anesthetist re-expanded the lung and the catheter was removed The closure was then completed and a petrolatum gauze dressing was applied A small rubber drain was inserted subcutaneously

The patient was returned to her room given oxygen by a nasal catheter and 5 percent dextrose solution in water containing 1 ampule of methoxamine hydrochloride intravenously The blood pressure stabilized between 90/60 and 100/70 Two hours after leaving the operating room the patient was reacting normally Four hours later she recognized her husband and requested that he remain with her A roentgenogram of the chest taken in her room revealed the left lung to be almost completely re-expanded An ECG was normal

The patient was followed postoperatively with additional roentgenograms and ECG s which were all within normal limits Her convalescence was complicated by a superficial breakdown of the thoracic wound and a slight pleural effusion but additional surgical intervention was not required The patient left the hospital on the fifteenth postoperative day

DISCUSSION

The incidence of cardiac arrest is apparently increasing but the complication is being recognized more readily by surgeons and trained anesthesiologists The unexplained death in the operating room" of many years ago is now being diagnosed The great number of thoracic operations now being performed will further increase the incidence of cardiac arrest Its cause is not clearly understood but contributory factors are hypoxia hypercapnia and vagal stimulation Physical factors which contribute to these conditions are senility and debility a preexisting anemia cardiovascular disease or an acute blood loss not quickly replaced Excessive preoperative sedation or an overdose of anesthetic may produce hypoxia or hypercapnia The role of reflex vagal stimulation is presumptive Reports have appeared citing cases of cardiac arrhythmia or arrest coincident with endotracheal intubation or extubation (4, 5) Various

(4) Barnard, C. L. LeRoux, F. J. and Swan, T. Electrocardiographic changes during acute hypoxia and during usual respiratory anesthesia Am. Heart J. 42 237 Aug. 1951

authors believe that the problem of vagal influences may only be produced in the presence of hypercapnia or hypoxia *(6)*

The anesthetist is responsible for early detection of this condition unless the surgeon has the heart or the great vessels under direct vision Permanent damage to the cerebrum or the psyche will result unless the circulation is restored within 3 to 4 minutes Death usually occurs in arrests of 8 minutes or longer Johnson and Kirby *(7)* stated that the surgeon must assume that arrest has occurred whenever the anesthetist reports that he is unable to detect a pulse or obtain a blood pressure reading Additional diagnostic procedures as electrocardiography, ophthalmoscopy, or prolonged auscultation only waste time Occasional errors in diagnosis may be encountered in patients with coronary occlusion or massive pulmonary embolus This risk must be accepted because prompt therapy will save more patients with cardiac arrest than will be lost through misdiagnosis Rupture of the heart during cardiac massage in the presence of myocardial infarction is usually a fatal complication *(8)*

Treatment of this condition is directed toward restoration of the normal heart beat and maintenance of the pulmonary oxygen supply This therapy is conducted initially by the anesthetist who forces 100 percent oxygen into the patient's lungs by artificial respiration through an endotracheal tube, or an adequate airway, using a tight-fitting face mask The surgeon must manually pump the oxygenated blood from the heart to the brain Cardiac massage is the most important therapeutic step Performed through a thoracotomy incision, it is so far superior to transdiaphragmatic massage that the additional incision should be made *(9)* Sterile preparation is not as important as an available knife

The incision should be made in the fourth or fifth left interspace and the adjacent ribs may be separated from their cartilaginous insertion 3 cm from the sternum if necessary The heart is grasped with the entire hand and regular forceful compression is administered from 50 to 60 times a minute The re

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(5) Sh ma k r H B J a d H mp m L J S dden de th oc ur ng imm d tely ft p r ti i p t t w th cardia d s s w th p rti ular t f r c to r l of pirat n thr gh nd trach l t be nd bat on. J Thor c c Surg 21 48 56 J 1951

(6) Sloa ll E V gus rv i ca d c rr st ff ct f hypercapnia hypoxia nd a phyx fl nh b f h rt Surg Gyn c & Obst 91 257 264 Sept 1950

(7) J hns J a d Kirby C K Exp ime tal tudy f rdiac ma s g Surg ry 26 472-478 Sept 1949

(8) Hurw t E S a d Se d be g B R pture f h rt dur g c rd c ma s A Surg 13 11 119 J 1953

(9) P l d us o diac r t Thirty-eighth Cl n cal C ngress Ame a C ll g f Surg s N w Y rk N Y S pt 26 1952

sumption of cardiac action is usually prompt if it is to occur If the heart does not begin to beat within 1 or 2 minutes after manual massage has been started or is feeble 0 5 cc of 1 1 000 solution of epinephrine should be injected into the left ventricle This dose may be repeated once only Fifteen degrees of Trendelenburg position promotes the flow of oxygenated blood to the vital brain centers Rapid blood transfusion into the aorta may be administered whenever excessive blood loss is a factor in the occurrence of the arrest

CONCLUSIONS

Cardiac arrest is an unusual but ever present danger in all surgical procedures Promptness in diagnosis and initiation of therapy are paramount in decreasing mortality Thoracotomy with cardiac massage can be performed by the average surgeon Everyone who undertakes surgery should be indoctrinated in the treatment of this condition Present day antibiotics nullify the complications which formerly followed the unsterile technic necessary for the immediate application of this therapy

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BOOKS RECEIVED

The R ntgen Aspect of th P p ll and Amp ll f V t by *M H H P pp l* M D F A C R Prof t f R d l gy N w Y k U ty P st-G d at M di l S ho l D rec of th R tg R y Depar m t B ll vu H p t l Co lt tn Rad l gy N ter Adm nist r H p tal B on N Y Co ult g Radiol g L d St N val H p t l St Alb Long I land P g l g t N w York U ty H p t l *H rold G J b n,* M D F A C R Director Dep rtm f R e tg ology H p t l fo Spe l Su g ry A oc Cl l Prof f R d l gy New York U et ty Po t-Gr ua t d al S hool N w York N Y Att d ng Rad l gy L S N rs Adm t H p t l F rme ly Ch f R d l gy Serv e L S N Adm n tr Ho p t l Bronx N Y nd *Robert B Sm th,* M D Sen R d Rad l gy V et Adm trat Hosp l B Y 195 P g ill t ed Ch le C Thom s Pu l sher Spr gf ld Ill 1953 P $8 50

United St Army W ld W II, Th T h l Ser ce Th Quart rma Corp Org t S pply and Ser by *Erna R k N l l Off f th Ch f f M l t ry H t ry Departm t f the Army* W sh on D C 418 P g Illu t d. U S Go e nmen P g Of ce W sh g D C p bl h 1953 Pr $3 25

Goat a d Goury Arthri Mod M d l Mon gr ph N by *Jok H Talbott* N D P f f M d c Th U ty f Buff lo School f Med F l -Ch f Buff l G eral H p t l P fa N Y 9 P g l d C & St Inc N w York Y P l t 1953 P $4

BILATERAL PAPILLEDEMA OF UNDETERMINED CAUSE[1]

IRA A ABRAHAMSON Jr *First Lieutenant MC USAR*
RICHARD RETTER *Captain, MC USA*
DAVID LaFIA *Captain MC USA*

MOST cases of choked optic disk suggest a tentative diagnosis of space-occupying lesion such as neoplasm, abscess, or subdural hematoma Other causes may be nonsuppurative encephalitis, arachnoiditis, and infection of a temporal bone (otitic hydrocephalus) or of the paranasal sinuses An interesting but unusual, group of patients with bilateral papilledema in whom the etiologic diagnosis was obscure has been encountered at this station Similar series of cases have been reported by Bedell *(2)*, Leinfelder and Paul *(3)* Mchinney *(4)*, Yaskin et al *(5)* and Leinfelder *(6)* All patients in the following case reports showed a definite papilledema as the main clinical finding and minimal or complete absence of general neurologic signs The presence of normal visual acuity the absence of any central or paracentral scotoma, and the lack of perivascular exudate ruled out a papillitis The peripheral fields were found to be normal but the blind spots were enlarged These findings would tend to indicate that the papilledema was due to increased intracranial pressure rather than inflammation of optic nerve fibers This series is of particular interest in that these patients were seen within a period of 12 months at this station, and all made a spontaneous recovery following ventriculography

CASE REPORTS

Case 1 A 25 year old man was admitted on 1 March 1952 complaining of diplopia occurring once or twice a week of 1 year's duration In the preceding 2 months this had been accompanied

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(1) U S Army H sp tal Camp Gord n, Ga

(2) B d ll A J Papill dema witho t incr a d intracranial pres ur Am. J Ophth 25 685-696 Jun 1942

(3) Leinf lder P J and Paul W D.. Pap lledema in g eral d ea es Arch Ophth. 28 983-987 Dec 1942

(4) Mckinn y J W P p lled ma f unknow et l gy Am. J Ophth. 31 866 1948

(5) Yaskin J C. Gr ff R A nd Shenki H A S r bilat ral papilled ma f ind terminat tiol gy with r port of 12 ca es Confinia neur l 9 108 128, 1949

(6) L nfelder P J Ch ked disk nd oth r typ of d ma of n rv he d c mm t on phys p th l g c features J A M. A 144 919-921 Nov 11 1950

by episodes of twitching numbness and weakness of the right side of the face and right sided temporal headaches Physical examination was negative except for papilledema of 1 diopter and slightly enlarged blind spots Leukocyte counts ranged between 10 000 and 15 600 with normal differential counts An angiogram of the carotid arteries was negative On 2 April a ventriculogram was negative On 12 May the disk edges were blurred but no papilledema was present He was discharged on 13 May improved

Comment A space-occupying lesion of the central nervous system was suspected but no evidence was found Papilledema was the only positive objective finding The papilledema and symptoms cleared spontaneously

Case 2 A 28 year old woman was admitted on 7 July 1950 complaining of bifrontal headaches of 1 months duration with occasional blurring of vision periods of confusion nausea vomiting and low backache Headaches originally started behind the right eye and gradually became bifrontal Physical examination was negative except for the ocular and neurologic findings There was bilateral papilledema of 2 or 3 diopters Central field revealed an enlarged right and slightly enlarged left blind spot with normal peripheral fields Unsustained bilateral nystagmus was present The right arm was slightly weak and stiff The finger to-nose test showed the right finger constantly missing the nose The leukocyte count was 13 700 with a normal differential count On 22 July bilateral ventriculograms were negative The papilledema decreased the symptoms were improved and the patient was discharged to her home on 5 July

Comment With the symptoms and signs of papilledema and other neurologic findings a right frontal or cerebellar lobe tumor was suspected All laboratory tests were negative and because the findings improved a diagnosis of papilledema without evidence of intracranial lesion (pseudotumor) was made

Case 3 A 5 year-old girl was admitted on 21 April 195 complaining of headaches of 4 weeks duration In February and March 1952 she had episodes of bilateral otitis media with perforation of her drums accompanied by profuse discharge Physical examination was negative except for ocular findings There was bilateral papilledema of 2 diopters The retinal veins were slightly engorged and a small hemorrhage was noted inferior and temporal to the right disk and nasal to the left disk On 9 May ventriculograms were normal The ventricular fluid contained 14 lymphocytes per cubic mm and 11 5 mg of protein per 100 cc On 3 June the discs were flat the edges still blurred but the venules were less dilated and tortuous The patient was discharged improved on 3 June

Comment With the history of previous otitis media, and the later findings of papilledema, a tentative diagnosis of otitic hydrocephalus was made The papilledema cleared several days after ventriculography, and 9 months later there had been no recurrence

Case 4 A 30 year old woman was admitted on 16 April 1952 with generalized headaches of about 2 weeks' duration On 13 September 1951 she had slipped and fallen, striking her occiput on a bare floor, and was momentarily unconscious For 3 days following the fall she had headaches associated with drowsiness On 2 April, she had developed severe bilateral frontoparietal headaches—worse when erect—associated with nausea and vomiting Physical examination was negative except for ocular and neurologic findings Her fundi revealed papilledema of 2 diopters, with blurred disk margins Her peripheral visual fields were normal and her central fields showed slightly enlarged blind spots The left side of her face was slightly more sensitive than the right and the right side of her body was more sensitive to pin prick and cotton than the left. Her spinal fluid had 12 cells per cu mm (11 were neutrophils and 1 was a lymphocyte) A roentgenogram of the skull was negative EEG revealed questionable right temporal focus Ventriculograms were normal on 17 April and again on 12 May The neurosurgeons noted increased intracranial pressure during the ventricular studies On 29 April the facial flatness was gone On 16 May there was no papilledema and the disk margins were almost clear The patient was discharged on 23 May improved

Comment In this case, the history was almost typical for a subdural hematoma Clinical tests ruled out this and other space-occupying lesions Papilledema which was the main clinical finding, cleared following ventriculography

Case 5 A 25 year-old man sustained a compound fracture of the right occipital bone with extension into the mastoid and laceration of the right ear drum in an automobile accident on 4 November 1951 He was admitted because of persistent frontal headache Funduscopic examination on 16 November revealed bilateral papilledema with a small hemorrhage near the left disk Peripheral fields were normal, and the blind spots were 15 times the normal size There was partial palsy of the right superior oblique muscles probably accounting for the diplopia Roentgenograms of the skull revealed a fracture of the right temporal region On 6 December ventriculograms were normal The neurosurgeons noted increased intracranial pressure On 13 December the diplopia and headache were gone and the papilledema had subsided He was discharged on 1 February 1952

Comment Because of the traumatic episode and the pre ence of bilateral papilledema a subdural hemorrhage was considered likely but the diagnosis was not substantiated His condition improved markedly after ventriculography

Case 6 A 22 year-old man was admitted on 24 June 195 complaining of daily headaches of 3 years duration Occasional ly the headaches were severe and not relieved by anything but sleep There was a history of several head injuries received in parachute jumps The first injury occurred 3 years prior to admission when he fell on his head while landing Althou h he was wearing a helmet at the time he developed severe frontal and occipital headaches thereafter I is second injury occurred when he was struck in the nape of the neck with a riser belt as his parachute opened There was a bilateral papilledema of from 1 5 to 3 diopters and blurring of the margins of the disks The peripheral fields were normal and the central fields revealed the blind spots to be 1 5 times the normal size On 1st August the spinal fluid pressure was 350 mm of H_2O with the patient in the sitting position A roentgenogram of the skull was negative On 5 August a right angiogram was negative On 1st August ventriculograms were normal On 25 September the right disk was blurred but not elevated and the left disk and blind spots had returned to normal

Comment With the history of the headaches and papilledema preceded by trauma to the head a subdural hemorrhage was suspected All tests were negative in localizing a space-occupy ing lesion Spontaneous recovery occurred after ventriculography

Case 7 A 27 year-old woman was first seen in the outpatient clinic complaining of bitemporal headaches of 9 days duration The headaches were slightly relieved by aspirin Physical ex amination was negative except for the ocular findings Dru en were present on the nasal portion of the right disk The margins of both disks were blurred and there was a bilateral papilledema of from 1 to 3 diopters The peripheral fields were normal and the blind pots were 1 5 times the normal size Becau e the papilledema persisted the patient was admitted to the ho pital on 16 October 1952 On 23 October ventriculograms were normal The disk flattened and the margins became more di tinct follow ing this procedure The blind spots became smaller in the follow ing weeks and the patient s symptoms lessened She was di charged on 12 November improved Slight blurring of the disk margins persisted

Comment Drusen may simulate papilledema, as described by Chamlin and Davidoff *(7)*, but because there was definite elevation of the disks bilaterally and the blind spots were enlarged, a diagnosis of papilledema was made The disks gradually returned to normal following ventriculography and the drusen at the right disk remained No definite cause of the papilledema was found

DISCUSSION

All these patients exhibited a frank papilledema on admission, and ventriculograms were made on each On discharge from the hospital none of the patients had papilledema, but 4 had blurring of the disk margins Ventriculograms failed to reveal a causative agent in any of the patients

The chief complaint of all these patients was headache Three had a history of definite trauma One had a history of otitis media preceding the onset of symptoms Three exhibited visual disturbances Two had minimal abnormal neurologic findings All had a definite measurable papilledema, varying from 1 to 3 diopters on repeated examinations Engorgement of the venules was present in 6 patients and hemorrhages were noted in 2 The peripheral visual field was normal, but the blind spot was enlarged from 1 to 2 times in all patients Angiograms, performed on only 2 patients, were normal Ventricular studies on all patients revealed increased intracranial pressure in 3 but no lesion in any All patients made a spontaneous recovery following ventriculography The papilledema disappeared, the blind spots returned to within normal limits, and subjective symptoms subsided

Bilateral papilledema of undetermined cause has been discussed previously by many investigators Brain tumor or some other space-occupying lesion should be suspected as the etiologic factor in all cases and must be ruled out The 7 patients observed by us exhibited bilateral papilledema and enlarged blind spots but normal visual acuities and peripheral fields

SUMMARY

In a group of patients in which bilateral papilledema and enlarged blind spots were prominent features ventriculography failed to reveal a space-occupying lesion Only 3 of the 7 patients exhibited increased intracranial pressure Because no common factor was found in these cases and the symptoms subsided and the papilledema disappeared following ventricular studies, the cause of the papilledema remains obscure

(7) Chamlin M and Davidoff L M. Drusen of optic nerve simulating papilledema J Neurosurg 7 70-78 Jan. 1949

BOOK REVIEW

Progre i Cl cal Psych l gy Volum I d t d by *D I Brou* Ph D D te tor f P ych log c l Ser ce P o n l Laboratory N w York N Y D p tm t f P y hol gy C ty C lleg N w York N Y and *Lawr c E Abt* Ph D Dir ct r f Res r h B mecha D n Ald R h Laborat New York N Y Con ul V t ns Admi i tratio 564 pag (2 ct ns) Gru e & Stra on I c N w Y k N Y publ h 1952 Section 1 P i $5 5 S ct on 2 P $5

The editors with the able assistance of 38 contributors many of whom are prominent authorities have set themselves the task of reviewing and evaluating the literature during the period (191f to 1951 52) subsequent to World War II This book assays the present state of clinical psychologic investigations against a background of social medical, and historical factors and attempts to evaluate them within the framework of general psychologic theory and methodology

Progress in clinical psychology has not been made equally rapid in all directions Trends in the development of any field of inquiry are often defined by omissions as well as by inclu sions by accentuation as well as by underemphasis It is diffi cult indeed to forecast the directions of future clinical psycho logic research If subsequent investigations are to follow the major trends of the immendiate past as disclosed in this volume the future looks dim and fruitless Psychologists are slowly un learning a lot about what clinical psychology teaches This book helps immensely to point up the many weaknesses and the few strengths of the budding young science of clinical psychology The editors plan to publish subsequent volumes every 9 years in such a way that topics of importance not included in this volume can be examined fully and at the same time areas of vital interest already included can be more systematically han dled because the period of coverage will be briefer

This volume will be indispensable for the teacher clinician and research psychologist The graduate student will welcome its abundant suggestions for thesis topics and di sertation prob lems The research psychologist will supplement this book with the *Annual Review of Psychology* and appropriate issues of the *Review of Educational Research* The volume offers an excelle t but brief overview of the progress of clinical psychology d ring the postwar period If the publishers had not forgotten the pocket book of the consumer they might have offered the two sectio s of this volume in one book with profit and savings to all con cerned —*Lt Col F Killian Jr USAF (MSC)*

SQUAMOUS CELL CARCINOMA OF THE MAXILLARY SINUS[1]

THOMAS BIONDO *Lieutenant Colonel* MC USAR

WILLIAM RAKOWER *Lieutenant junior grade* DC USNR

THE dentist may have an important role in the detection of a malignant growth in the mouth and biopsy may aid in the diagnosis of any abnormal condition in or about the mouth Most carcinomas of the maxillary sinus occur in adults over 50 years of age, and usually result in death within 2 years of the diagnosis (2) Because of the size of the sinus within which the neoplasm grows, much time may pass before clinical symptoms become pronounced (3)

The first symptoms of this lesion may be a purulent or bloody nasal discharge, pressure or neuralgic pains in the sinus area, and bulging of the maxilla overlying the growth Such patients may be first treated for pyorrhea, toothache, or simple sinusitis, depending on the location of the neoplasm within the sinus, and its size The tumor may invade the orbit, nares, infratemporal, and pterygopalatine spaces It may erode and break through the palatal as well as the buccal plates of bone As bone destruction progresses and the tumor grows, a fungating mass may be seen at the opening of the sinus, on the bony wall of the nose or in a tooth socket The tumor's growth may thus result in the loosening of teeth in the area, trigeminal neuralgia, and exophthalmos Invasion of the upper jaw by carcinoma of the maxillary sinus usually occurs intraorally in the region of the hard palate or in the socket of a tooth previously extracted for pain or looseness (2) This lesion is treated by electrosurgery followed by radiation therapy (2 3)

CASE REPORT

A 37-year old man about mid August of 1952 first noticed some discomfort and a "blister" on the left side of his palate in the molar area He was examined by a dentist at an Air Force Base about 1 September, and, the upper left second molar was removed The "blister" did not disappear and 2 days later the upper left

(1) U S Army Hospital Fort Dix N J

(2) Geschickter C F and Copeland M M Tumors of Bone 3d edition J B Lippincott Co Philadelphia P 1949

(3) Paddock E C Surgical Diseases of Mouth and Jaws W B Saunders Co Philadelphia P 1938

... required (a maximum of 1 phys... ... a maximum of 3 5 physician hours a week ...

... were examined individ... ... 2 days a week to the ... hours to complete the pre...

... talks were placed in 5 ... (1) problems of the first trimester (2) problems of the second trimester (3) problems of the third trimester (4) labor and delivery and (5) care of the new ... The series was repeated every 5 weeks Because patients were instructed to return every 4 weeks each patient heard a different talk each visit for 5 visits Those patients who were seen for more than 5 to nine visits because some of them did not come in prior to the third month for the initial examination

Questions from the patients were encouraged and not limited to the phase of pregnancy under discussion by the medical staff Patients were assigned to talk in rotation so the patient could learn and know all the staff In each series a physician talked on a different subject so that he would not become stereotyped Talks were kept short and simple so that patients would not become tired or confused Visual aids were used ...

RESULTS

... for about 10 to the ques... ... their reactions ... the number of an...

... children have ... had 1 child 29 had ... had 6 and 1 had 9

... be of two ... answered no and 15 ...

... twenty-three ...

... prese... fear ...

... that the ...

did not already know This will inevitably be true of some patients Many of these same patients wished to continue the classes for other reasons Two patients stated that this method took more of their time For the average patient the time was less than that used previously waiting in the clinic Six patients deplored the loss of the personal touch " This was the most common complaint of patients being treated by medical officers in spite of the excellency of the treatment given We hoped to lessen this difficulty by having the patients get to know all the staff and hear them discuss the patient's problems without being hurried Under the old plan the patient might wait several hours to see a harried doctor for about 5 minutes

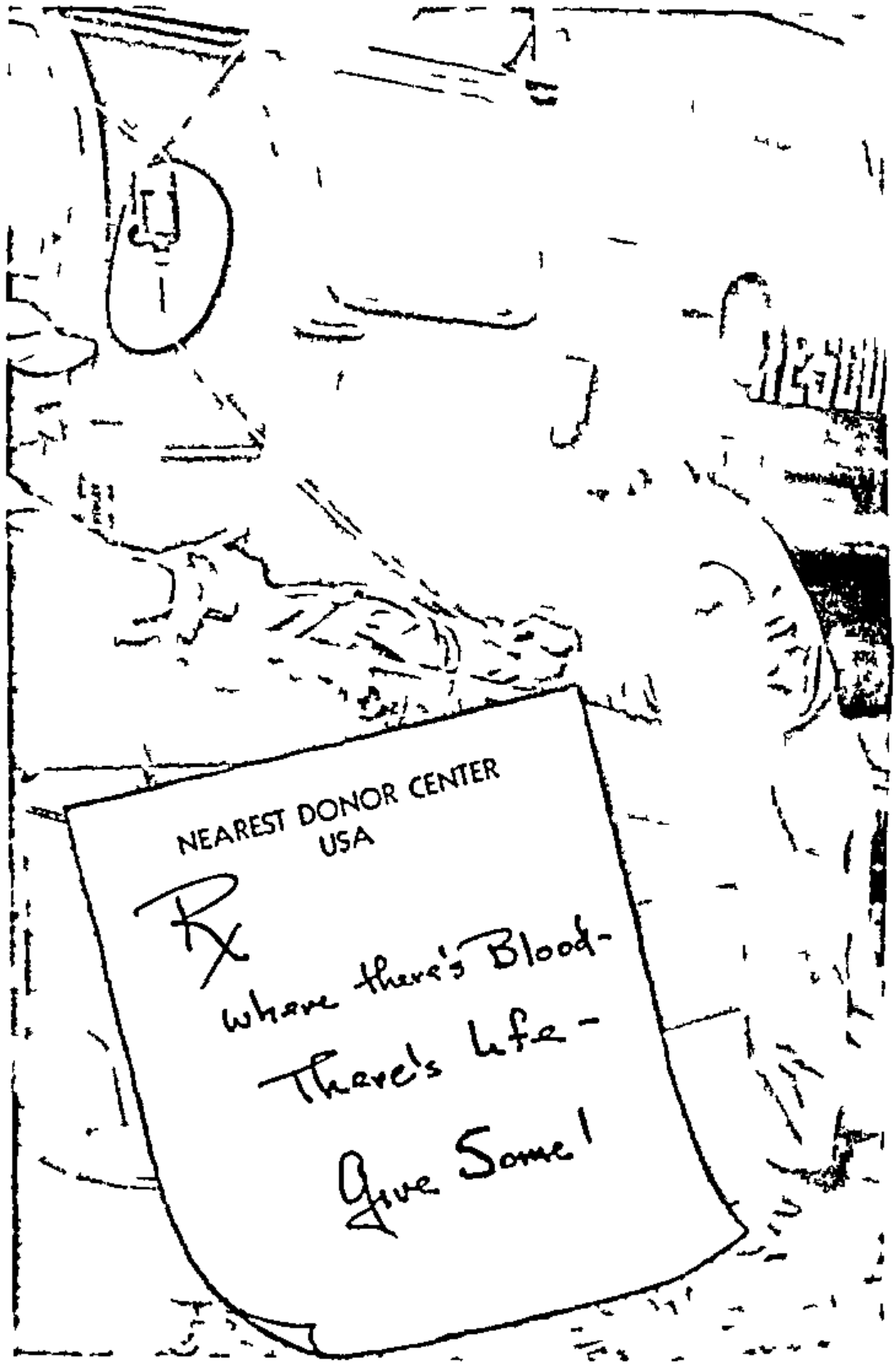
One patient stated that she found difficulty in building up her confidence in anybody This is another common complaint against Army medicine Adequate treatment must include more than the management of the physical needs of the patient, it must give her confidence and peace of mind also Because it is not possible to guarantee that a certain physician will deliver a given patient, we hoped to encourage the patients to develop confidence in the obstetrical service as a whole I believe that the plan presented was more successful in this than was the old method Three patients said they were embarrassed to ask questions in front of the assembled group We were aware that this would be a problem and tried to overcome it by reminding patients that they were "all in the same boat " An additional aid was *not* to discourage those who stayed after class to ask personal questions One patient complained that she did not get enough time to talk to the doctor when he checked her chart Questions and discussion during checkup were discouraged, but patients were urged to ask questions after the talks

Favorable comments were less broad in scope, but more numerous 12 patients were glad to learn about *themselves, their* pregnancy, and care of the newborn, 6 evinced enthusiastic approval without giving reasons 1 believed that this method gave a more personal contact with the physicians, and 4 liked the plan because it took less time

Both from the material presented and from the personal comments of patients regarding this program I believe it was well accepted by this group of Army patients and that it would be well accepted by most patients attending large obstetrical clinics

SUMMARY

The plan presented helped to instill confidence in the prenatal patient for the obstetrical service and thus allayed many of her fears and uncertainties These patients can be given the


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VOL. IV AUGUST 1953 NO. 8

UNITED STATES ARMED FORCES MEDICAL JOURNAL

Published Monthly by the Armed Forces Medical Publication Agency Department of Defense

ROBERT J. BENFORD *Colonel USAF (MC) Editor*
BENNETT F. AVERY *Captain MC USN Associate Editor*
PATRICK I. MCSHANE *Colonel MC USA Associate Editor*

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FOREWORD

The *U t d St t Arm d F c M d l Journ l* th m d m for dis m t g nformat on f dmu rat d pt f on l t ll m d c l p on l of th D p tm t f D f Th A t t S cr tary of Def (Jl lth d M d l) a d th Surg on G ral f th er l s s t all med l off d nt l off Med al S rv Corp ff Nurs Corp ff s d ff of h V t ary Corp f th A med F s d th m d l c lta t f h A my N vy d Air Fo t bm t m pt for p bl t on th *J rnal*

MELVINA CASBERG M D
A s t t S cr tary f D f (H lth nd M d l).

MAJOR GENERAL GEORGE E ARMSTRONG
S g G al U t d St t Army

REAR ADMIRAL LAMONT PUGH
S g G eral U t d St t N vy

MAJOR GENERAL HARRY G ARMSTRONG
S g G l U t d St t A Fo

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Monthly Message

When Gideon that valiant warrior of sacred writ started out on one of his military campaigns the voluntary status of his followers was questionable By a series of eliminative procedures he removed the undesirable element reduced his band to a smaller but more effective voluntary combat unit and routed the enemy The intervening years have in nowise diluted this basic truth namely that a captive element may not only be a disgruntled and unenthusiastic one but also that its involuntary status may tend to dissipate the strength of the whole By eliminating the majority of the unwilling group a smaller but much stronger component is created

In the light of our basic interest in creating a hard core of career military medical officers serious thought must be given to the ultimate advantages of allowing resignations from the regular service On superficial examination especially in view of the necessity for a continued doctor draft law this might appear to be not only politically unwise but also inequitable Nevertheless I am certain that after careful objective study one cannot fail to accept the long range wisdom of such a policy

We are defeating our own ends when all we can offer to a potential career officer is an indeterminate and indefinite period of service He might want to try the military service as a career but he would have justifiable misgivings about entering a captive status Furthermore the prohibition of resignations obviously has frozen within the services certain disgruntled officers who spread their discontent to their associates and contribute little to the morale of military medicine It will be to the advantage of the Armed Forces to develop again a voluntary medical career corps which no longer works under the stigma of captive restrictions

Audrey A Casberg

A Casberg M D
nt Secretary of Defense
Medical)

MEDICINE AND THE CURRENT MILITARY EFFORT

HARRY G MOSELEY *Colonel USAF (MC)* (1)

PHYSICIANS, dentists, and other professional people who enter one of our armed services often find themselves engaged in activities which are unusual in their professional experience, and ask the reason for such an assignment Likewise, civilian members of the profession, in contemplating our defense effort, may ponder the wisdom of the policies which guide the medical services Much information on the activities in our defense effort can be found by examining the medical needs of the armed services, and the methods by which the medical profession can serve them

To gain perspective of the magnitude of the task which confronts the medical profession in the current military effort, it is advisable to examine the main factors which guide the medical effort. These factors are (1) the structure and methods of the defense elements which must be considered in the medical effort (2) the actual medical needs of the Armed Forces and (3) the type of organization which will permit medicine to be most effective in its mission to assist the Armed Forces in the defense of our society In this presentation medical science will be considered in its broadest sense, encompassing the many talents and skills which are dedicated to, and involved in the healing art

The need for our defense effort receives but *for no matter where we look in history or modern* defense intimately woven into the life and des cultures, and nations Aggression appears to be human behavior that has not changed throughout defenseless have been its victims from time be unreasonable for one to assume that our tinue as we know it with a weak or no preservation of our society can well stand parodness against aggression, and the effort defense will be directly proportional to our bined contributions

This discussion is concerned only with defense represented by our Armed Forces,

(1) Office of the Assistant Secretary of Defense (Health and

medical requirements If the Armed Forces could be compared to an individual or even to a community its medical needs might be anticipated and efficiently provided for with little alteration of our established lives and practices However the armed services have a structure a mission and an accountability and present medical requirements which are peculiar unto themselves An understanding of these factors leads to an understanding of the seemingly obscure activities of the military medical services

Our Defense Department is a tripodal structure with 3 separately administered military departments These departments are coequal and independent from each other Over them is the Office of the Secretary of Defense which serves to co-ordinate and guide their activities

In regard to mission and accountability 2 factors are encountered which have bearing on the medical effort The first *the principle of command is the mission of each of the armed services which demands an extraordinary cohesiveness* in order that it does not disintegrate under stress or onslaught To provide that cohesion the will of the individual is subjugated to the mission of the organization to a degree not normally encountered in democratic society In regard to accountability the military service is a servant of the American society dedicated to its protection and accountable to the public which it serves Medicine in serving the military population must also account for its activities An understanding of this is important because it provides reasons for the endless system of records and documents required by our military system

THE ARMED FORCES MEDICAL REQUIREMENTS

Only the most salient military medical requirements are discussed below Throughout the discussion of how the American *medical profession can best serve the Armed Forces however* there is the constant principle that military medicine must maintain liaison with civilian medicine This is not stated as a requirement because it is more in the nature of a fundamental truth Military medicine is not a unique code or method of professional practice It is American medicine for Americans in their country s uniform There is great mutual responsibility on the part of both the physician in civilian life and in military practice to gain maximum support from each other These ties are already strong The military physician turns to the civilian specialty boards for approval of his technic or therapeutic understanding *before he can be qualified as a specialist The civilian physi*cian should understand the intricacies of the military medical requirements in order that his judgment of the defense effort may be sound Mutual understanding leads to more constructive professional efforts by both civilian and military practitioners

Prevention of disease and disability There are several reasons underlying the magnitude of this familiar topic In the military service, large numbers of persons from diversified environments, who have been seldom exposed to endemic disease, are placed in close contact in areas where dissemination of disease is opportune Even the more immune individuals must be protected from cyclic waves of attenuated infection Our troops are often stationed in remote lands and in environments where their exposure to unfamiliar disease is certain To engage this problem, the medical profession must provide immunization inoculations, the control of insects and vectors, and the application of hygienic principles in field sanitation

The military forces must not be saddled with physically handicapped persons The necessity for eliminating those who are physically and mentally unable to meet the military demands is the purpose of entrance physical examinations The recognition of incipient disability is accomplished in annual physical examinations The necessity of preventing our government from being burdened with false claims of disability lies behind separation physical examinations The requirement that physicians prevent disease and disability is not a unique task, but it is an important one

Care of sick and wounded This is a requirement of the military services upon the profession which is comparable to civilian medical practice Technics and treatment are identical with those used in civilian practice The diseases encountered for the most part are also familiar ones Traumatic conditions, though sometimes of unfamiliar magnitude, respond to known principles The care of the military patient may be accomplished in tents or dugouts, but it closely parallels that in civilian medical practice When the patient recovers, the military requirements differ In civilian life a convalescent patient may be sent home and permitted to do light work The military services require a well and healthy man or none at all This is why convalescence from an appendectomy requires 2 weeks instead of 2 days A partially healed man is actually a complete casualty in the service

Specialization in military medicine and research Physicians in the services must specialize in military medical subjects and often engage in military medical research The military direction of aviation medicine, for example, into the supersonic and rare atmospheric regions has no immediate civilian counterpart Investigations must be made into areas of human tolerance that are new frontiers The submarine forces require that medical research be directed to unusual areas Likewise, the soldier requires that the physician be specialized in the military phases

of psychiatry and surgery so that he may survive the mental and physical trauma of battle

Military necessity also guides military medical officers and civilian physicians alike into unusual fields of research Global warfare often makes rare diseases common and medical researchers are asked to find safeguards against them Military medicine must deal with the results of planned destruction The enemy s potential to produce biologic evil requires research into unfamiliar diseases and into unknown elements of human tolerance

Assistance in military planning It may seem paradoxical that physicians dedicated to healing should assist in military planning which is dedicated to destruction Actually military planning is not only a matter of destruction but is also one of preservation of its own forces It is in these plans to save lives and prevent disabilities that the profession of medicine must offer its contributions Military plans must consider biologic hazards if they are to be successful Conquests in which the threat of mosquitoes had been ignored have failed because of malaria campaigns have fallen because the threat of disease and the limitation of human tolerance were not considered of great importance There are biologic and chemical potentials of destruction that must be investigated and understood if they are to be countered The ordinary everyday planning however requires the greatest attention How many tons of medical supplies must be included in the equipment needed for a campaign? How many aircraft in a theater of operations must be devoted to the evacuation of the wounded? How many trucks in a convoy will be required to carry the medical personnel? How much delousing equipment will be needed on remote shores? Although the military requirement that physicians assist in planning is not a major one it is of fundamental importance that they have a deep understanding of the military service itself

Mobility The military service is a fluid force subject to rapid and vast environmental change Its medical support must be mobile This applies equally to equipment hospitals and talents It requires improvisation and adaptability It requires adaptation to commands orders and regimentation which are necessary to maintain the integrity of organization

Preparedness The medical profession must be prepared This requirement has led to misunderstanding dissatisfaction and animosity The nature of the military forces themselves is such that they must exist in a state of constant preparedness against threats of violence to our nation This state of preparedness requires that physicians be trained in many subjects which appear to be foreign to the professional field and that they be avail

able where they are needed and in adequate numbers It is this latter requirement, that physicians be available in the *strength* needed, which is most controversial and almost insolvable Because one can never predict where a large number of professionally skilled persons will be needed to attend casualties from an unannounced offensive action, it is almost impossible for the profession to be fully prepared to attend military needs In geographical areas of greatest tension, however, it is necessary to have an excess number of physicians This may appear wasteful, yet it is vitally necessary

Careers in the military service It is difficult to estimate how much the Armed Forces would suffer if its professional practitioners had only a casual military interest, and considered military professional practice solely as an obligation to be fulfilled as soon as possible Professional practice in the military service is a complex art that is not learned or assimilated easily Military medicine employs a method of practice involving mass populations and methods of application which are often foreign to civilian experience Many of the requirements that the armed services place upon physicians can only be met by professional personnel who have had years of military experience and have devoted long periods of study to military medical specialties

Finally, professional careers are necessary to provide the foundation and framework of a military medical organization This is of outstanding importance because an effective medical organization within the Armed Forces is essential in order that the multiplicity of professional talents, technics and skills may function efficiently with interlocking support under continually changing conditions and through the entire gamut of physical and mental stresses

ARMED FORCES MEDICAL ORGANIZATION

The medical organization of the Armed Forces has been studied in detail by the Hawley Committee in 1949, and by many other committees Of the various organizational possibilities, these studies have pointed out the following (1) a single unified organization separate from the military departments (2) a single organization functioning under one military department, (3) separate medical organizations for each military department, and (4) separate medical organizations for each military department, but under the control and guidance of a single head

There are 2 sets of criteria which should be applied to any medical organization within the Armed Forces The first is administrative, and embraces the organization, law, and policy which control the military effort and under which medicine

must function The second is professional and has been discussed

A single unified organization separate from the military departments This is the type of organization which many persons have in mind when they raise the question Why are not the military services unified? The question apparently envisions *the military medical organization as a single unified body under* the leadership of a single individual or leading group Some believe such an organization would abolish intraservice friction and result in a saving of manpower and dollars by elimination of duplication

One type of such a separate medical organization would be an agency which is completely independent from the military structure This appeals to some as a method by which the practice of medicine in the Armed Forces would be unencumbered by military doctrine In effect military medicine would become another government agency However tremendous difficulty and confusion would arise if such a separate government agency were responsible for assisting in military planning research preparation and in providing medical care to military units overseas on ship board and in combat Under such a plan the essential medical support required by the Armed Forces would be abolished

A variation of this plan is to withdraw all or the majority of military hospitals in the United States from the Armed Forces and place them under the control of some other federal health service The functions of the military hospitals are manifold They give professional care to the military patient and also provide his organizational identity his pay and uniforms and disciplinary control Training of technicians corpsmen and other skilled persons is accomplished in these hospitals If the Armed Forces lost all or even the majority of its hospitals in the United States the military medical officer procurement programs would be seriously affected The transfer of these hospitals to another Government agency would result in an inferior medical service for our troops a serious impairment in our ability to prepare for war and a virtual destruction of the Armed Forces medical services

It appears that the most workable method of establishing a single unified medical organization would be to create a fourth arm in the Department of Defense This might be termed Department of Medical Services This type of unification also has incompatibilities and inadequacies Administratively it would be impossible to establish such a single unified medical service in the Department of Defense under current laws This

difficulty could be overcome by new legislation Yet if legalized, there would be multiple and unavoidable complications The first would be the financing of the new military medical department. This includes not only the cost of hospital construction, medical supplies, equipment, and maintenance, but also the pay for officers, enlisted personnel, and civilians in the department Both a budget and a finance division would be required within the medical service A personnel department with qualified officers, clerks, and all the impedimenta incident to keeping track of human beings would have to be inaugurated Provisions would have to be made for the purchase stocking, and distribution of medical supplies and for the repair and maintenance of equipment and facilities This would add a tremendous logistic load on the medical department Hospital construction would create other problems, and require medical department engineers, draftsmen, and other experts The nonmedical functions of a separately established medical department are infinite These functions are currently being performed by each of the military departments by its own personnel, logistics, and engineering experts A separate medical department initially might borrow some of the nonmedical services from other military departments, but the eventual result would be that it would acquire its own legion of nonmedical experts Thus, the attempt to attain unity would produce further duplication and create additional national expense rather than savings

The most serious objection, however, to such a single medical department would be the impaired effectiveness of the medical service in giving essential support to the military departments concerned This leads to a discussion of how such essential medical support would be compromised if the profession were placed under a single *military* department. The same considerations apply to unification by establishing a fourth arm in the Department of Defense

A single organization functioning under one military department This alternative would produce unity of medical activities without major administrative obstacles If the entire medical department were under one of the 3 services, the parent military department could carry the great load of nonmedical functions and still keep the medical organization compact For example, the entire military medical service could be placed under the Surgeon General of the Army and his staff It is therefore appropriate to determine whether or not the medical profession could meet the requirements of the Armed Forces under such an organization

In prevention of disease and disability the Army would find, if it were solely responsible for this service, that it would have

to interject itself into the organization of the Navy and Air Force in order to give immunizations, conduct physical examinations, and sponsor sanitary precautions, and would be confronted with the problem of reports Prevention of illness requires anticipation of incipient threats to health and an examination of disease trends and potentialities by the review of continuing statistical reports of disease and disability and sanitary conditions throughout the Armed Forces The Army would be handicapped in obtaining and enforcing directives from the Navy and Air Force which are necessary for an effective reporting procedure Although a single medical service under the Army could meet the Armed Forces responsibility for the prevention of illness and disability a medical service more intimately associated with *each* of the 3 military forces could do it better

In caring for the sick and wounded the Army would experience little difficulty in giving medical care to the patients of all 3 services in specialized treatment centers and in larger hospitals except for problems of paying clothing and disciplining Navy and Air Force patients Under field and combat conditions the Army would find that the only way it could furnish close medical support to the Navy and Air Force would be to assign medical personnel and hospital units to these services In this respect the medical profession would have two masters—the Army to which it belonged and the Navy or Air Force which it served This is at variance with military principles of control

In specializing in military medicine and research all professional officers if assigned to the Army would often be placed in positions of difficult relationship It takes many years to develop experts in submarine medicine and aviation medicine The *professional expert must be closely identified with the specialty* to which he is dedicated The medical officers who had dedicated their careers to these specialties would find both their identities and their effectiveness reduced if they were under Army *control subject to Army orders and in essence stepchildren of* a mother whose primary responsibility was to a different mission Similar compromise would apply to research If all medical research personnel were under Army control it would only be natural that their activities would be directed in a major part toward the problems of military medicine with which the Army is confronted while the research problems of the Navy and Air Force would not receive full support

In assisting in military planning the Army would find that it was responsible for giving medical advice to naval personnel planning the conquest of an island The Army would be responsible for giving medical advice to the Air Force concerning human limitations in stratospheric flight The Army would have

the responsibility for detailed plans of medical supply and logis tics for submarine and shipboard medicine, for aviation medicine, and for all the hospitals, dispensaries, and aid stations of these services To understand the actions, policies, directives, and pecularities of any one of the services requires a long period of close identification with its plans, policies, and methods of action Only those physicians who have been closely associ ated with the military structure are fully qualified for the re sponsibility of planning They know the operational, personnel, and logistic factors peculiar to the military department which must be considered in any plan

Mobility in the Armed Forces is not a simple thing because a multitude of men and objects are subject to abrupt dislocation without disintegration There must be guidance, direction, and exceptional authority to attain mobility The military force which does not have command prerogative cannot move No military unit could effectively utilize its medical component unless it had direct command over it In this respect the practice of medicine could not be organized under Army control and still effectively serve the Navy and the Air Force

Preparedness requires training, and a single medical service would be handicapped in training professional personnel in the requirements of the other services Preparedness requires professional personnel to be in the required places and in adequate numbers Professional personnel will probably never meet in full the requirement of preparedness so there will be continuous and chronic shortages If the entire military medical service were under the Army, this service, naturally, would be more concerned with its own professional requirements than those of the Navy and Air Force An equitable distribution of professional per sonnel would be difficult to obtain Each military department is given the heavy burden of preparedness and each should have equal authority in its medical requirements in this field

In attracting physicians to careers in the military service, a single medical department under the Army would find one of its greatest deficiencies It is difficult to understand how work able career patterns in Navy and Air Force medicine could be established Nonmedical career personnel of the Navy and Air Force would be reluctant to include an Army medical officer in their own organizations and customs, and the recruitment of professional personnel would suffer The inability of a physician to choose and be assured of a career in the branch of the service of his choice would be a strong dissuading factor Medicine organized under one branch of the military service could not meet in full the requirement for professional careers in the mili tary services

Separate medical organizations for each military department Because of the laws and customs governing a military structure and the need for meeting the intimate and unique medical requirements of military departments the United States and many other nations with more than one military department has followed the principle of separate medical services for each This type of organization as well as the desirability of having a separate Army and Navy was generally accepted prior to World War II Several factors have arisen which changed previous concepts of military structure and of warfare itself The first of these was the emergence of air power A third dimension was added to warfare and on many occasions operations in the air became as important as those on the ground or on the sea Established and proved principles were re-examined and often changed because of the implications of air power The second factor was the unification of command World War II clearly revealed that the day of independent operation of an army a naval force or even a nation had passed The unified efforts of all the military services of many nations under a single commander was shown to be enormously more effective than the separate efforts of military departments or of nations This principle was not new but it is now global in concept The third factor was the concept of total war or of full mobilization of all national effort and resources for military purposes Wars had previously been fought by armed forces with varying degrees of civilian support but now a nation s effectiveness is directly proportional to the depth and strength of its economic foundation Modern warfare and modern defense have become dependent upon not only military but also civilian decisions in the apportioning of goods and manpower

At the end of World War II what had formerly been a separate Army and Navy in this country became a separate Army Navy and Air Force What had formerly been relative independence of action between an army and a navy now had to be unified action between three fighting elements and allied armed forces and what had formerly been a civilian society and a military force had now become a complete national defense effort It was still apparent that a separately administered and a separately commanded Army Navy and Air Force was essential Separate departments were more flexible than a combined force and separately administered departments were much more conducive to freedom of enterprise and to the growth and progress essential to the rapidly changing technology of modern warfare This had its effect upon the way the practice of medicine should be organized to meet our defense needs

Separate medical organizations for each military department under the control and guidance of a single head The National

Security Act of 1947 provided for a separately controlled and commanded Army, Navy, and Air Force, and for a Department of Defense as an agency over the 3 military departments to co-ordinate and guide their efforts The Department of Defense functions through assistant secretaries and various councils and boards The National Security Act has fostered a more unified and compact defense organization without compromising the integrity of the separate military departments

Shortly after the establishment of the Department of Defense, it became apparent that the profession of medicine should be given representation at the department level Several methods of medical representation have been tried in the Department of Defense but the basic responsibilities have not been significantly altered In the current medical organization in the Department of Defense there is an Assistant Secretary of Defense (Health and Medical), who provides the Secretary of Defense and principal members of his staff with advice and assistance on health and medical aspects of Department of Defense policies, plans, and programs establishes and reviews health and medical policies plans standards, and criteria for the Department of Defense provides for the maintenance of close co-operation and mutual understanding between the Department of Defense and the civil health and medical professions, and represents or arranges for the representation of the Department of Defense with other governmental, nongovernmental, and international organizations on health and medical matters of mutual interest or responsibility

The Assistant Secretary of Defense (Health and Medical) is assisted by a Civilian Health and Medical Advisory Council which consists of 6 civilian members who are authorities in the health and medical fields The Assistant to the Secretary also utilizes the advice, assistance, and facilities of the Surgeons General of the 3 military departments to whatever extent necessary in the solution of military medical problems and in the formulation of co-ordinated activities and policies The medical organization within the military departments themselves is not altered by the establishment of the Office of the Assistant Secretary of Defense (Health and Medical) The Surgeons General continue to remain responsible for the health of their own military departments

This type of military medical organization with 3 separate medical departments under the control and guidance of a single head has the advantage of allowing the medical profession to meet effectively its basic mission of full and intimate support to each military department It is able to co-ordinate and guide the military medical activities of the 3 separate departments

During the brief existence of the current organization significant progress has been made in defining broad military medical goals and in producing a co-ordinated and unified military medical effort This organization integrates the military medical effort with both American civilian medical practice and our national defense effort In being closely identified with our national defense effort medical support becomes directly proportional to the defense will of our democracy By such close identification the medical organization will grow change and progress directly with the evolution of concepts and the variations of global pressure which shape our national destiny

SUMMARY

Military medicine has many responsibilities in the current military effort These go far beyond the care of the sick and injured and the prevention of disease and disability Medical officers must specialize in certain military medical fields participate in research in unusual areas contribute to military planning adapt themselves to rapid change and mobility undertake measures of preparedness and some must take up careers in military medicine The practice of medicine must be intelligently organized within the Armed Forces if it is to be efficient in its contributions The merging of the medical services of the Army Navy and Air Force would not increase medical efficiency on the contrary it would compromise medical effectiveness The current organization of 3 separate medical departments under the control and guidance of an Assistant Secretary of Defense (Health and Medical) is an appropriate structure under which the profession of medicine can contribute to the defense of our nation

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BOOKS RECEIVED

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ACUTE PORPHYRIA[1]

A Problem in Medical Diagnosis

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PORPHYRIA is a rare metabolic condition in which there is an increased production and excretion of abnormal porphyrin with a diversity of clinical manifestations. Interest in the disease has been stimulated in the past decade by Watson and his associates *(2-5)* but the disease is still relatively unfamiliar and frequently undiagnosed. In the past 2 years 4 patients with acute porphyria have been studied at this hospital.

CASE REPORTS

Case 1. A 27-year-old woman was admitted on 14 January 1951. Her health had been excellent until 1944 when, 10 days after having a sore throat, she developed a temperature of 106° F. with bilateral pain in the costovertebral angles, urinary frequency and urgency, dysuria, ankle edema, nausea, and vomiting. She passed dark colored urine for the first time. She gradually recovered in 6 weeks.

For the next 6 years she was asymptomatic and her urine was normal in color. Three weeks prior to present admission she had had a mild upper respiratory infection which subsided. Two weeks later she had transient mild aching pains in her arms and back. On 14 January she developed severe bilateral costovertebral angle pain radiating to both shoulders, left flank, and right upper quadrant, accompanied by a low grade fever, nausea, vomiting, urinary frequency, dysuria, and moderate oliguria. The family history was noncontributory. She retched repeatedly, appeared acutely ill, and was dehydrated. There was moderate tenderness in the left upper abdominal quadrant, left flank, and both costo-

(1) W[illegible] R[eed] Army H[ospital] [illegible] Washington D. C.
(2) W[atson] C. J. P[orphyria] I. Cecil R. L. (editor) Textbook of Medicine 7th edition W. B. S[aunders] Co. Philadelphia P[a.] 1947 pp. 734-738.
(3) W[atson] C. J. and Larson E. A. Porphyrin and Their Relation to Disease. Porphyria Oxford Medicine Vol. IV Part II Oxford University Press New York N. Y. p. 28 (1-59).
(4) W[atson] C. J. and Larson E. A. Urinary coproporphyrins. health and disease. Physiol. Rev. 27 4 8-510 July 1947.
(5) W[atson] C. J. Some recent studies of porphyrin metabolism and porphyria. Lancet 1 539-543 Mar. 10 1951.

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vertebral angles No abnormal coloration of the teeth or skin lesions were found

Penicillin intravenous fluids and meperidine hydrochloride were given initially with the addition of aureomycin intravenously the day after admission The absence of chills and pyuria the presence of only low grade fever and the lack of response to antibiotics ruled out pyelonephritis On the third hospital day a urine specimen, light yellow on voiding became reddish brown on standing Tests of her urine for porphobilinogen and uroporphyrin were positive Quantitative determinations of coproporphyrin were done on twelve 24 hour urine specimens and values ranging between 215 and 1 321 μg were obtained (normal values for our laboratory are less than 250 μg per day)

The severe abdominal and back pain abated somewhat but on 21 January marked fluctuations developed in her mood and she was irrational at times The following day she complained of *numbness and weakness in her legs On 23 January she fell and* struck her head following which she became drowsy and her deep tendon reflexes were diminished or absent bilaterally Roentgenograms of her skull were negative On 26 January a positive Babinski sign was noted on the right side Her sensorium improved but weakness of all extremities became progressively worse An electroencephalogram on 29 January showed generalized slow frequency waves of the type seen in stuporous conditions but without evidence of seizure or localization Respiratory paralysis gradually developed with atelectasis of the left lung and the patient died on 6 February

The autopsy findings included atelectasis of portions of the left lung and mild chronic cystitis There were microscopic areas of focal necrosis in the liver with some vacuolization and fragmentation of myelin sheaths of peripheral nerves and shrunken deeply stained neurons in sections of the cerebral cortex

Comment In this patient with acute porphyria, primary disease of the renal tract was first suspected but the chance observation of change in the color of the urine on standing led to the correct diagnosis which was confirmed by chemical tests The patient s mental aberrations and neurologic involvement were classic findings of the clinical syndrome The few pathologic changes found in the postmortem examination illustrated the absence of a specific lesion associated with porphyria

Case 2 A 32 year old woman was admitted for the second time on 8 May 1950 She had been well until November of 1917 when she complained of severe upper abdominal pain which lasted 3 months and for which no cause could be found She had 4 subsequent similar episodes prior to her first admission on 9 January

1950 She frequently had had bullous lesions on the dorsa of her hands and had noticed that her urine was often dark in color, and that at times her skin was overly sensitive to sunlight Her family history was negative

During the week prior to her first admission, she had abdominal pain, severe headache, nausea and vomiting, and gradually increasing weakness of her hands There was a history of grand mal type of convulsive seizure Her urine was positive for uroporphyrin and porphobilinogen Acetylsalicylic acid, acetophenetidin, and barbiturates intensified her symptoms The weakness in her hands persisted and bilateral wrist drop and muscular atrophy of the upper extremities became progressively worse She had a panhysterectomy for symptomatic endometriosis and was discharged from the hospital on 17 April much improved

Following a tooth extraction on 4 May under local anesthesia, the patient developed generalized muscular aching and the abdominal pain, nausea, and vomiting recurred within 24 hours On 8 May her urine was again dark, and she was admitted to this hospital for the second time Her temperature was 98 6 F, pulse rate, 102 respirations, 16 and blood pressure, 130/104 She appeared acutely ill Examination revealed generalized mild abdominal tenderness, and the right kidney was palpable Weakness and atrophy of the intrinsic muscles of both hands, as well as marked weakness of the extensors of the elbows, wrists, and fingers, were present The leukocyte count was 12,600 with 83 percent neutrophils, 15 percent lymphocytes, and 2 percent eosinophils Qualitative tests on the urine were positive for uroporphyrin and porphobilinogen The urinary coproporphyrin level was 137 3 μg in a 24 hour specimen

Ten milliliters of 10 percent calcium gluconate given intravenously failed to relieve the abdominal pain and it was necessary to use meperidine hydrochloride A second generalized convulsive seizure occurred on 10 May On 13 May the patient fell and struck her head Neurologic examination and roentgenograms of the skull were normal On 15 May her rectal temperature rose to 101 4 F and remained slightly elevated Following another convulsive seizure on 16 May she remained drowsy and within 8 hours nearly complete paralysis of both upper and lower extremities had developed On 17 May her intercostal muscles were very weak, her pulse varied from 108 to 140, and she had difficulty in swallowing and talking She was conscious but irrational A lumbar puncture performed the next day was normal Constant suction was needed to keep her pharynx free of secretions She succumbed shortly after a tracheotomy on 19 May Permission for autopsy was not granted

Comment This patient s acute porphyria was classic with intermittent abdominal colic progressive paralysis of the limbs mental changes and terminal respiratory paralysis The diagnosis was confirmed by the presence of uroporphyrin and porphobilinogen in the urine Trauma or surgery may precipitate such an acute exacerbation and this patient s terminal episode was preceded by a tooth extraction Drug addiction may become a problem in the care of these patients The history of bullous lesions on the hands and possible photosensitivity caused us also to consider porphyria cutanea tarda described by Waldenstrom *(6)* and by MacGregor et al *(7)* as the diagnosis

Case 3 A 31 year old woman admitted on 6 May 1950 had been well until her first pregnancy in 1949 when she developed nausea vomiting and midepigastric pain and passed dark urine for the first time These symptoms continued after her delivery and her physician prescribed acetyl alicylic acid and belladonna which gave some relief The symptoms recurred in episodic fashion especially during subsequent pregnancies and lasted from 2 to 3 weeks each time

A diagnosis of porphyria was made at another military hospital in April of 1950 Following a tooth extraction under local anesthesia in December of 1950 she had an exacerbation of symptoms She was admitted to another hospital on 21 June 1951 for further observation and because of habitual abortion Of her 7 pregnancies only the first in 1942 resulted in a full term living child Her family history was negative Qualitative tests of the urine were mildly positive for uroporphyrin and strongly positive for porphobilinogen The urine coproporphyrin level was 506 μg for a 24 hour period A tubal ligation via the vagina and a uterine dilatation and curettage were done on 24 July There was a recurrence of the symptoms of porphyria postoperatively but she recovered satisfactorily and was discharged 6 August Because the endometrial tissue showed suspicious areas of increased mitoses on histologic examination the dilatation and curettage was repeated at another hospital in January of 1952 and again she had a brief recurrence of the symptoms of porphyria She was referred to this hospital on 6 May 1952 for a third dilatation and curettage or an elective hysterectomy

Physical examination was normal The coproporphyrin level was 358 8 μg in a 24 hour urine specimen but qualitative tests for uroporphyrin and porphobilinogen were negative

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(6) W ld m J S d b Porphy A ta m d S d pp 82 pp 1 254 1937

(7) Ma G g A G N h l R E H d R m g C Porphy ia ta ta ta g f lud g l f m h h d bed p phyr A h In M d 90 483 504 O 1952

Because no apparent pelvic pathologic changes were present, hysterectomy or further uterine curettage was not indicated. Such procedures might have induced an exacerbation of the porphyria. She was discharged on 28 May in good health.

Comment.—This patient presented a picture of classic acute porphyria, manifested chiefly by gastrointestinal symptoms of a rather mild nature. Positive urine tests for uroporphyrin and porphobilinogen confirmed the diagnosis. Like the patient in case 2, she had repeated exacerbations following surgical trauma. She also had recurrences during each pregnancy. Only necessary operations should be done on such patients, because even minor surgical procedure might have produced a fatal exacerbation.

Case 4.—A 27 year old man had been in excellent health until 10 October 1951, when he noticed lightheadedness and frontal headache during descent in an aircraft from high altitude. Two days later, he developed colicky abdominal pain that increased in intensity during the next 2 weeks. During his hospitalization, nausea, vomiting, and severe abdominal pain, mainly after eating, necessitated intravenous feeding. On 26 October his daily urine specimen was inadvertently allowed to stand for several hours and it became dark. A diagnosis of porphyria was made and confirmed on laboratory study. He received large doses of ascorbic acid without complete relief of symptoms, but returned to duty in January of 1952 in spite of recurrent abdominal pain. On 26 June his urine became darker in color. Four days later his abdominal pain became severe and his urine was cherry red. He voided small amounts with hesitancy and had a diminished urethral sensation during micturition. His symptoms remained severe until 10 July and then improved. He was transferred to this hospital on 20 July.

The patient's history did not reveal photosensitivity. One sister died at the age of 22 years, 2 weeks after the onset of acute abdominal pain, followed by nausea, vomiting, paralysis of both lower extremities, and incontinence. A laparotomy failed to reveal any abnormality and she died 4 days postoperatively. The autopsy diagnosis was said to be that of a lower nephron nephrosis. His mother, father, and 2 other sisters were alive and well.

Physical examination was normal. Nineteen daily urine specimens were positive for uroporphyrin and porphobilinogen. The urinary coproporphyrins varied from 790 to 2,228 *μg per 24 hour* specimen with a usual range of from 1,200 to 1,700. Impairment of liver function was reflected by sulfobromophthalein retention of 8 to 12 percent, cephalin cholesterol flocculation of 1 and 2 plus, and prothrombin concentration of 50 *percent*. A liver biopsy revealed portal fibrosis with foci of necrosis and moderate irregularity in the size and shape of the cells and their nuclei.

Because of the reported relief of symptoms by the use of ganglionic blocking agents (8) he was given 50 mg of hexamethonium subcutaneously which was followed by a temporary increase in the abdominal pain and the occurrence of low back pain During the next month mild abdominal pain persisted and he experienced episodes of marked tremor and anxiety which lasted several hours The urinary coproporphyrin level remained consistently elevated He received 1 000 μg of vitamin B_{12} subcutaneously each day from 10 September to 19 September without any changes in his clinical status or laboratory findings His symptoms continued to be mild and he was returned to duty on 29 October

Comment The onset of symptoms was abrupt in this patient He may have had some neurologic involvement as suggested by his hesitancy and diminished urethral sensation during micturition The family history was important because there was evidence that a sister had died of porphyria Liver involvement a frequent manifestation of porphyria, was revealed in this patient by abnormal hepatic function and a biopsy showing portal fibrosis and necrotic foci Despite reports that ganglionic blocking agents are helpful a single dose of hexamethonium aggravated his symptoms Based on Watson s finding (5) that vitamin B_{12} prevented porphyrinuria in animals, massive doses were tried, but without success

DISCUSSION

Congenital porphyria during childhood is characterized by photosensitivity of the skin, reddish discoloration of the urine and pigmentation of the teeth It is more common in men and is transmitted as a Mendelian recessive trait Uroporphyrin of type I and porphobilinogen are absent Because coproporphyrin and uroporphyrin are increased in the normoblast and in the bone marrow in this type of the disease Watson (3) has recently classified congenital porphyria as porphyria erythropoietica

The mixed or chronic type of porphyria has features of both the congenital and acute type with varying mixtures of uroporphyrin and coproporphyrin in the urine Porphobilinogen is absent but MacGregor et al (7) have stated that it may be present terminally

Acute porphyria probably also inherited is more common in women and usually appears in adults Photosensitivity is usually absent Although rare it is more common than congenital porphyria and is characterized by episodes of intermittent acute abdominal neurologic or mental symptoms followed by asymp-

(8) [illegible] porphyria A [illegible] M d 89 111 114 J 1952

tomatic periods The demonstration of porphobilinogen is diagnostic of this type of porphyria Uroporphyrin of type I and coproporphyrin of type III are excreted in the urine and feces Watson *(5)*, Watson and Larson *(3 4)*, Dobriner and Rhoads *(9)*, Welcker *(10)*, Prunty *(11)*, and MacGregor et al *(7)* have reviewed the present knowledge of porphyrin metabolism

Waldenström *(6)* traced the disease through 2 or 3 generations and believed that the defect was transferred as a Mendelian dominant characteristic Nesbitt *(12)* reported 3 cases in the same family He also found porphobilinogenuria in 2 asymptomatic relatives of a patient with acute porphyria Calvy and his associates *(13)* in an investigation of the family background of a 20-year old man with mixed porphyria, found evidence of acute porphyria in 7 of his relatives, including 4 siblings The recognition of such cases is of practical importance, because acute attacks have been precipitated in porphyria patients and in their unsuspecting relatives by such drugs as barbiturates

Nervous system disturbances are common and may be the first manifestation of an attack *(14)*, although they often occur as the abdominal symptoms are subsiding Of 143 cases reported by Waldenström *(15)*, 60 had neurologic symptoms Investigation of the spinal fluid usually shows no abnormalities, although Lyons *(16)* reported 1 case in which changes were noted Frequently, bizarre complaints without objective findings lead to a diagnosis of neurosis or hysteria The development of neurologic symptoms is of grave significance, and may increase the immediate mortality rate to as high as from 50 to 75 percent *(14 15 17)*

Porphyrins in porphyria may have a role similar to uric acid in gout The relation of the defects in porphyrin metabolism to the symptomatology and pathology is not clear There may be interference with the synthesis and release of acetylcholine *(14)* Watson believed that porphobilinogen, present in acute porphyria

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(9) D b K d Rhoads C P P phyrins in health nd disea Phys ol R 20 416-468 July 1940

(10) Wel k r M L Porphyria (M d cal Pr g es ect o) N w Engla d J M d 232 11 19 J 4 1945

(11) P unty F T G Acut porphyria inv t gat o n path logy f porphyrins d d ntif cat n f xcr tu n f ur porphyrin I Ar h Lt ed 77 623-642 June 1946

(12) N b tt S Acute porphyria J A M A 124 286- 94 J 29 1944

(13) Cal y G L J ruszew k E J nd Cart ll H H. P rphyria cl ical obs rva t nd family g ri Ann I t Med 34 767 77 Ma 1951

(14) B ck I L. N uropsychiatr ma if tat ns f porphyria r iew f t. l t ratur Am Pra t & D g st T e t 2 65 -661 A g 1951

(15) Wald strom J N ur l g cal ympt ms s d by so-call d a ut por hyria A ta P y hiat t N ur l 14 375-379 1939

(16) Ly H A A t p phyria w th spinal fluid ha g A n. Int Med 33 711 717 S pt 1950

(17) Calvy G L Porphyria c ns d rat n urgical drug osis Surg Gyn c & Ob 90 716-721 Jun 1950

with abdominal and nervous symptoms but absent in congenital porphyria, may in some way be responsible for the symptoms Application of porphyrins direct to the bowel produced a spasm which was unrelieved by atropine but clinically the abdominal symptoms may stop while the excretion of porphyrins continues

Patchy degeneration of the myelin sheath of the peripheral nerves and anterior horn cells and degenerative changes in the autonomic ganglia particularly in the celiac plexus have been described Intracellular pigment deposits and cirrhosis also have been reported Oliguria has been attributed to transitory spastic changes in the renal blood vessels but inflammatory and necrotic changes in the renal arterioles have occurred

Although the color of the urine varying from brown to red and depending upon the pH is often attributed to the presence of porphobilinogen it may be due to other pigments In acute porphyria uroporphyrin I in loose combination with a type III porphyrin is present as a zinc complex *(4)* The urine may be normal in color after voiding and then change to the color of red Burgundy after standing in the sunlight. During the acute attack porphobilinogen is present and gives a positive reaction to the Watson Schwartz test *(18)*

Porphyinuria or the presence of increased amounts of normal porphyrins in the urine must be distinguished from porphyria The former may occur in hepatitis cirrhosis pernicious anemia heavy metal intoxications and in a variety of febrile illnesses, but the diagnosis of porphyria depends upon the presence in the urine of such abnormal pigments as uroporphyrin Waldenström s porphyrin or porphobilinogen

TREATMENT

Treatment is unsatisfactory consisting largely of the avoidance of drugs known to act as precipitating factors and the protection of the skin from sunlight. Relief of severe abdominal pain is one of the chief therapeutic concerns Wehrmacher *(8)* reported success with tetraethylammonium chloride tubocurarine benazazoline hydrochloride and splanchnic block but one of our patients experienced aggravation of his abdominal pain after the use of hexamethonium as a ganglionic blocking agent.

SUMMARY

Four patients with acute porphyria 2 of whom died, were observed in 2 years The age range was 27 to 32 years and only 1 was a male Acute porphyria should be considered in the differential diagnosis of acute abdominal conditions acute p y

(18) T C J d S hw tz S S mpl for ur nary porph b l g P oc Soc E pe B l & M d 47 393 394 Jun 1941

chotic episodes, and primary renal tract disease A Watson-Schwartz qualitative test for the presence of porphobilinogen can be done quickly and easily the color of the urine should be noted on voiding and after standing in sunlight for several hours Treatment has proved unsatisfactory Surgical procedures may precipitate a fatal attack Certain drugs, especially the barbiturates, are to be avoided for the same reason

BOOK REVIEW

Group Psychotherapy Studies in Methodology of Research and Therapy Report of a Group Psychotherapy Research Project of the U S Veterans Administration by *Florence B. Powdermaker* Ph D M D Responsible Investigator and *Jerome D Frank*, Ph D. M D. Principal Assistant in collaboration with *Joseph Abrahams* A B *Albert E. Dreyfus* M D *Henry S Maas* Ph D *Robert MacGregor* M A *Joseph B. Margolin* M A. *Helen T Nash* B A *Morris B. Parloff* M A *David Rosenthal* Ph D and *Edith Vogel* M. A. M S. 615 pages Harvard University Press Cambridge Mass publishers 1953 Price $6.50

This research report in group therapy is a welcome addition to a new and growing field of psychiatric treatment procedure It is the most comprehensive study to date and will serve as a useful guide for both students and practitioners of the group therapy process The two parts of the book deal with 124 outpatients of a mental hygiene clinic and with 88 hospital patients with chronic schizophrenia

This study involved 2 distinct problems, one of isolating and studying specific situations experienced by the psychiatrist who tries different and varied techniques commonly used in group therapy with the subgoal of modifying techniques to fit the group and the other of evaluating the effects of the group therapy process on the patients who participate in it.

One new concept introduced which may well be used by other investigators is the use of both a wire recorder and an observer in an effort to obtain a more complete understanding of the group process It is interesting to note that while the psychiatrist is always the leader the importance of the observer grows as the leader becomes less threatened The authors stated that all but one of the doctors at the clinic reported at the end of the study that they desired observers in any future group work This is interesting because some of the psychiatrists apparently had had less experience in group therapy than the observers Out of

the meetings of the psychiatrist and observer held before and after the group session grew a better understanding of the group process and a chance for better co-operation between the psychiatrist and his nonmedical professional colleagues

The psychiatric evaluation of the patients studied was done on a subjective basis and included pre- and post-therapy estimation of significant factors The social workers did a careful study of the interpersonal relationships of the patients and therapist in an attempt to evaluate improvement The clinical psychologists also studied the group process They relied most heavily upon the Rorschach test but no significant statistical results could be demonstrated The test proved useful in subjective evaluation of patients conventionality fantasy ability to conceptualize speeding up or slowing down of thought processes presence or absence of tension and direction and control of aggression Testing was repeated at intervals and was useful in helping to define the therapeutic problem for particular patients

The hostility of patients toward the doctor and as in individual therapy the importance of the therapist s ability to handle his own feelings is brought out. Both successful and unsuccessful handling of the common problems in group therapy are illustrated by examples

Illustrative material is also presented on how to handle antagonism between group members the forms of resistance and their solutions (including group silences) the effect of the introduction of new members problems which arise when the group leaders are chan_ed and the effect of the therapist s personality on group interaction

Part II of the volume covers the problems of group therapy with hospitalized schizophrenics and a statistical comparison of experimental and control groups is made in an effort to measure effectiveness of the group process The statistic results are disappointing if the criterion of discharge is used but more subtle improvements not subject to statistical analysis were found in the experimental group As with the neurotic group *problems of hostility sexuality and rivalry* are discussed with examples

One of the goals of this research work was to find the most effective means of teaching the technics of group therapy to young psychiatrists on that score the authors have been successful Though not an easy book to read it will prove to be a ready and reliable reference for those working in group therapy who seek knowledge of how the problems they will encounter are best overcome —*Capt J F McMullin MC USN*

INTRAVENOUS USE OF ACTH IN RHEUMATIC PNEUMONITIS

ROBERT L. CHANCEY *Major USAF (MC) (1)*

RHEUMATIC pneumonitis is one of the most serious complications of acute rheumatic fever. Seldin et al. (2) reported on 6 patients with rheumatic fever, complicated by pneumonitis, who died. These authors considered the development of rheumatic pneumonitis a grave prognostic sign. Jensen (3) reported a 19 year old man whose death resulted primarily from pneumonitis without significant cardiac involvement. Muirhead and Haley (4) also reported a patient with fatal rheumatic pneumonitis. Shopfner and Seife (5) presented a patient with acute rheumatic fever and pneumonitis whose death occurred 4 days after discontinuance of ACTH.

The clinical picture of rheumatic pneumonitis may be that of a mild respiratory disease with cough productive of small amounts of blood tinged sputum or there may be a sudden onset of acute respiratory distress with severe dyspnea and cyanosis and moderate to marked fever. If right sided heart failure occurs, the disease often terminates fatally (2, 6).

The roentgenologic picture reveals a patchy pneumonitis, often with pleural effusion. Lees (7) stated that the left lower lobe is most commonly affected but the pneumonitis may be focal, evanescent, and migratory. Griffith et al. (6) found that in very ill patients multiple and upper lobe involvement is most common. These authors also found that the areas of density may shift rapidly.

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(1) U. S. A. F. Hospital, Lowry Air Force Base, Colo.

(2) Seldin, D. W., Kaplan, H. S., and Bennett, I. L., Jr.: Rheumatic pneumonia, A. M. A. Arch. Int. Med., 89: 496-520, April 1947.

(3) Jensen, C. R., Jr.: Hypersensitivity pneumonitis (rheumatic) pneumonia, Arch. Int. Med., 77: 237-253, March 1946.

(4) Muirhead, E. E., and Haley, A. E., Jr.: Rheumatic pneumonitis; case of widespread chronic (proliferative) type with acute (exudative) focal, Arch. Int. Med., 80: 328-34, Sept. 1947.

(5) Shopfner, C. E., and Seife, M.: Rheumatic pneumonitis and hemorrhagic pneumonitis treated with ACTH, U. S. Armed Forces M. J., 3: 819-824, June 1952.

(6) Griffith, G. C., Phillips, A. W., and Archer, C. P.: Pneumonitis occurring in rheumatic fever, Am. J. M. Sc., 212: 22-30, July 1946.

(7) Lees, A. W.: Acute polyarthritis with pulmonary consolidation and pleural effusion, B. M. J., 1: 246-248, Feb. 2, 1952.

The histologic picture of rheumatic pneumonitis presents an angiitis with endothelial proliferation hemorrhage necrosis, and hyalinization of the arteries and capillaries of the lung *(5 6)* Aschoff bodies may be found in the lung tissue *(6)* but in a report of 45 fatal cases of rheumatic fever Epstein and Greenspan *(8)* did not find them in the pulmonary tissue of any of their patients

In a study of 119 patients with rheumatic pneumonitis Griffith et al *(6)* classified the pneumonitis into 3 types a primary acute pneumonitis which may be the presenting manifestation of acute rheumatic fever a secondary acute pneumonitis which occurs during the course of established rheumatic fever and a subclinical type of pneumonitis which is usually discovered accidentally in cases of subacute monocyclic rheumatic fever The 2 patients described in this report are considered to be examples of secondary acute pneumonitis

CASE REPORTS

Case 1 An 18 year old man was admitted to the hospital on 29 February 1952 complaining of stiffness of his knees and aching in the sole of the left foot for 2 days Seven weeks prior to admission he had had a sore throat which was treated with one injection of penicillin Physical examination revealed an acutely ill patient with a temperature of 100 F pulse rate 102 and blood pressure 110/80 The heart was not enlarged to percussion A systolic thrill was palpable in the third left interspace next to the sternum The heart sounds were distant There was a grade III long harsh systolic murmur and a grade II harsh decrescendo diastolic murmur His knees were moderately swollen red hot and tender Initial laboratory studies revealed a leukocyte count of 8 850 hemoglobin 14 7 grams and sedimentation rate (Wintrobe) 31 mm Electrocardiogram was within normal limits Throat culture showed normal flora

A diagnosis of acute rheumatic fever was made and on 1 March injections of 75 mg of cortisone intramuscularly every 6 hours were begun Three grams of potassium chloride daily and a low sodium diet were prescribed The following day the patient was unimproved The temperature was 104 F and the pulse rate averaged 140 The systolic thrill and systolic murmur were still present but the diastolic murmur was no longer audible The next day the patient appeared critically ill Respirations were rapid and shallow Heart rate was 150 with a regular rhythm The systolic thrill was more marked The systolic murmur was still present and the diastolic murmur had again become audible

(8) Ep E Z. d G nsp E B Rh ma pn m ia A h I M d 68 1074 1094 De 1941

An electrocardiogram showed elevation of the S T segments in leads I and II, depression of the S T segment in aV_R, and elevation of the S T segments in V_4 through V_6 The tracing was interpreted as suggestive of pericarditis

At midday the patient became cyanotic and disoriented Bronchial breathing was present over the left lower lung field posteriorly The heart was enlarged in the fifth interspace on the left to the anterior axillary line A bedside roentgenogram showed marked cardiac enlargement with haziness over the left lung field The right lung field was clear Sputum culture revealed neisseria species, *Streptococcus viridans* and pneumococcus The leukocyte count was 23,200 with 86 percent neutrophils

During the afternoon of 3 March 20 mg of ACTH in 1,000 cc of 5 percent dextrose was started as a slow intravenous drip, and cortisone was discontinued Penicillin, 100,000 units every 3 hours, and 0 5 gram of streptomycin every 12 hours were also begun and the patient was placed in an oxygen tent During the next 15 hours there was remarkable improvement The fever, which had ranged from 102 to 104 F , decreased to 99 F The pulse rate decreased to 84 and the respiratory rate, from 35 to 40 to 16 The patient was alert and well oriented The heart was still enlarged to the anterior axillary line in the fifth interspace on the left A loud, rough, to-and fro pericardial friction rub obscured any murmurs which might have been present. The joints showed improvement, and an electrocardiogram indicated the presence of pericarditis Twenty milligrams of ACTH was given as a slow intravenous drip

On 5 March a roentgenogram showed marked cardiac enlargement and a small amount of fluid at the left lung base (fig 1) Daily intravenous administration of ACTH was continued The patient continued to improve and was removed from the oxygen tent after 4 days of ACTH therapy His temperature, pulse, and respiration remained within normal limits By 11 March the pericardial friction rub had disappeared and a grade II, long, harsh systolic murmur was heard in the second and third left intercostal spaces next to the sternum On 13 March a roentgenogram showed the lung fields to be clear and the heart normal in size (fig 2)

During the next 3 weeks, at irregular intervals, a rumbling, mid diastolic murmur was heard at the cardiac apex The patient developed an acneform eruption of the face and anterior chest, and a moonface became evident, but no other side effects of the ACTH were seen Varying doses of ACTH in 1,000 cc of 5 percent dextrose were given for the next 5 weeks The

Fig. 1 (case 1) Rat 18 gram tak th day of treatment with ACTH
Fig. 2 Same rat 10 day after ACTH

patient's subsequent course was uneventful Three weeks after admission his electrocardiogram and sedimentation rate were normal The systolic murmur along the left sternal border gradu ally decreased in intensity and by July 19 2 was no longer au dible

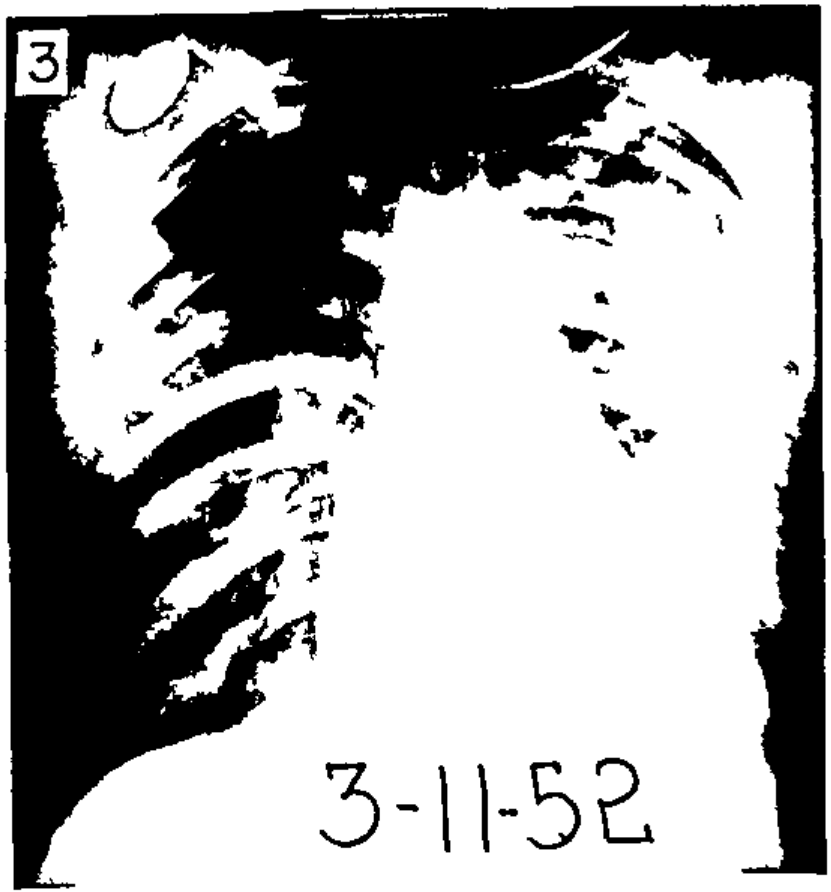
The patient was last seen 7 months after the onset of his ill ness At that time physical examination revealed no abnormali ties

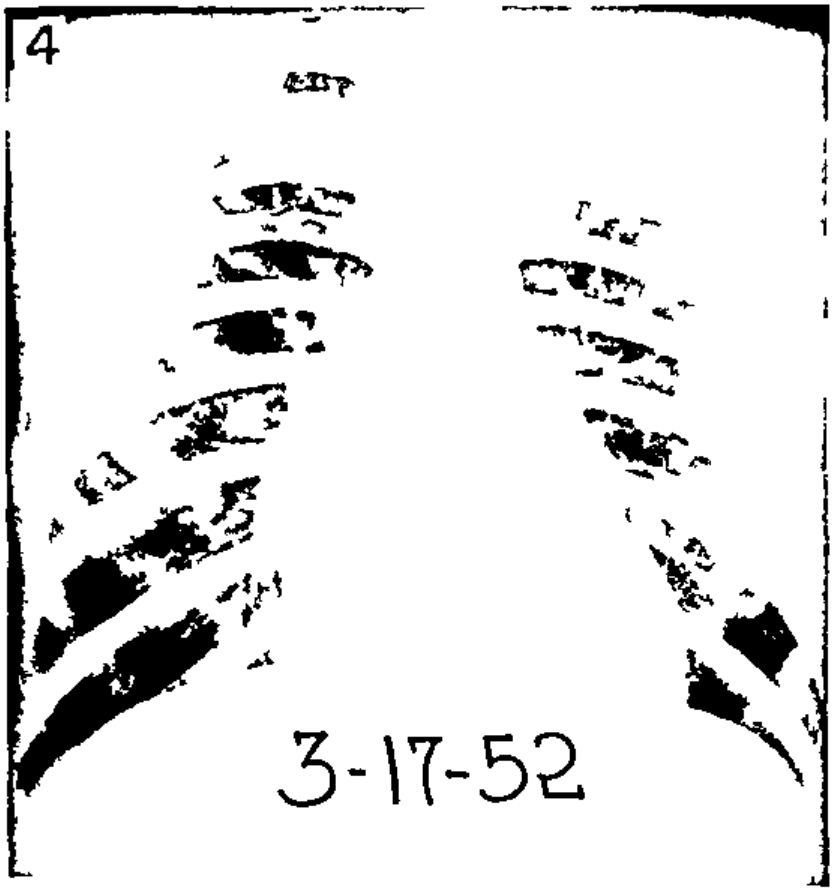
Case 2 An 18-year old man was admitted to the hospital on 7 March 1952 because of pain and swelling of both knees and ankles for 1½ days Four weeks prior to admission he had had a sore throat which was treated with 4 consecutive daily injec tions of penicillin Three weeks prior to admission he was again treated in the same manner for a sore throat His past history re vealed an attack of rheumatic fever with fever and joint pain at the age of 13 He was told by his family physician that he had developed a "weak heart" as a result of this illness and he was not allowed to participate in sports during high school

Physical examination at the time of admission revealed an acutely ill patient complaining of severe joint pain His pulse rate was 110 temperature, 98 F and blood pressure, 110/76 There was a grade I, high pitched, diastolic murmur, heard best in the third left intercostal space next to the sternum The right knee and left ankle were hot, red, swollen, and tender Lab oratory studies included a leukocyte count of 22,500 with 82 per cent neutrophils and 18 percent lymphocytes The hemoglobin was 13 8 grams and the sedimentation rate (Wintrobe), 44 mm

A diagnosis of acute rheumatic fever was made and the patient was started on 75 mg of cortisone intramuscularly every 6 hours A low sodium diet and 3 grams of potassium chloride daily were begun at the same time His temperature increased to 102 8 F on the evening of the first hospital day On the second hospital day, the patient still appeared acutely ill, but he stated he "felt a lot better " Examination revealed the previously described di astolic murmur, a tachycardia rate of 110, and a systolic gallop at the cardiac apex An electrocardiogram showed a first-degree heart block and changes compatible with pericarditis In addition to the joints involved on admission, the right wrist, left knee, and right ankle were swollen, hot, and tender

In the early morning of 9 March the patient became dyspneic and cyanotic Examination revealed his pulse rate to be 150 and blood pressure, 100/76 His lips and nail beds were cyanotic and there were medium moist rales throughout the left lung field In the posterolateral portion of the left lower lung there was an area of bronchial breathing The heart was enlarged in the fifth





F pur 3 (2) fi d id oe tge gr m t k ft 2 d y f t tme t u th ACTH Γ g 4 S m p t t ft 8 d y of t tm t th ACTH

intercostal space on the left to the anterior axillary line A to-and fro friction rub was present over the entire precordium, but there was no distention of the neck veins

Cortisone was discontinued and 100,000 units of penicillin every 3 hours and 0 5 gram of streptomycin every 12 hours were started Oxygen was given by nasal catheter Twenty milligrams of ACTH in 1,000 cc of 5 percent dextrose was started as a slow intravenous drip The patient became worse during the day He became irrational and complained of precordial pain The cyanosis persisted and his blood pressure decreased to 92/70 The following day he remained in critical condition and the physical findings were unchanged ACTH was repeated and he was digitalized without any appreciable response In the afternoon the patient became semicomatose and responded only to painful stimuli

On 11 March a bedside roentgenogram revealed dense infiltration involving the greater portion of the left lung and a diffuse haziness over the right lung field (fig 3) ACTH (20 mg each 24 hours) was continued by intravenous drip for 4 days, and the patient began to improve By 14 March he was alert and hungry Examination of the chest revealed only a few fine moist rales at the left lung base posteriorly A grade I, apical, systolic murmur was present but the pericardial friction rub and the diastolic murmur were not heard A roentgenogram on 17 March revealed the lung fields to be clear (fig 4) Serial electrocardiograms revealed the presence of pericarditis The patient became asymptomatic, but on 20 march the aortic diastolic murmur reappeared

The patient's hormone therapy consisted of 20 mg of ACTH daily for the first week of treatment, then 15 mg daily for the second week During the third and fourth weeks of treatment he received 10 mg daily and for the fifth week 5 mg daily Except for the 4 day period during his severe illness when the ACTH was given continuously, it was administered as a slow intravenous drip in 1,000 cc of 5 percent dextrose for from 10 to 12 hours daily After cessation of hormone therapy, the sedimentation rate became elevated for a few weeks The aortic diastolic murmur was heard intermittently until May 1952 The electrocardiogram gradually returned to normal and the patient was ambulated in early July 1952 He remained under observation in the hospital until early October 1952 and was then returned to military duty When last seen in December 1952 he presented no evidence of disease

DISCUSSION

Many investigators *(9 15)* have found that ACTH and cortisone have a suppressive effect on acute rheumatic fever Some believe the course of carditis is favorably influenced, especially if the treatment is begun early *(9-11)* Sheinkopf et al *(15)* believe the course of the disease is definitely shortened by ACTH but others *(14)* have reported no favorable influence on its duration or on the degree of cardiac involvement Mandel et al *(16)* reported the intravenous use of ACTH in a variety of diseases and advocated this method of administration Griffith et al *(17)* believe the response of adrenocortical activity is more rapid with ACTH administered as a continuous intravenous drip and Shopfner and Seife *(13)* reported a more dramatic response in rheumatic fever patients when the ACTH is given intravenously

The 2 patients reported on were receiving adequate doses of cortisone at the time they developed a complicating pneumonitis In several other patients with rheumatic fever who were being treated with cortisone I have observed that beneficial effects may not appear for from 48 to 72 hours later I believe that patients seriously and acutely ill with rheumatic fever should receive ACTH intravenously in preference to cortisone In these 2 patients intravenous ACTH appears to have been lifesaving There was a prompt and favorable response in both patients with disappearance of all signs and symptoms of pneumonitis and improvement in the carditis

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(10) W l M. G nd H lp H. N Eff f p ry d ocor p hormo (ACTH) h ma ca d is J A M. A 145 133 138 J 20 1951

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(12) Ba A R Sm h H. L Sloc mb C. H P ll y H. F nd H h P S Eff ct of cortisone nd ort ottop (ACTH) on pha f h ma f furthe b rva ons Am. J Dis Ch ld 82 397 425 Oct 1951

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SUMMARY

In 2 patients with rheumatic pneumonitis, ACTH administered intravenously was of lifesaving value It proved to be superior to cortisone in rapidly suppressing the signs and symptoms of the acute rheumatic process

ADDENDUM Since this article was prepared another patient with rheumatic pneumonitis has been treated with ACTH intravenously in the manner described above He was an 18-year-old man with pneumonitis involving the right lower lobe with cardiac enlargement and an aortic diastolic murmur There was marked symptomatic improvement and complete disappearance of the pneumonitis in less than 48 hours after beginning therapy

BOOK REVIEWS

The Metabolism of the Tubercle Bacillus by William F Dorn, D N D Associate Laboratory Directory Colorado Foundation for Research in Tuberculosis Colorado College Colorado Springs Colo and Anatole Andrejew I C Research Staff National Center for Scientific Research in France Pasteur Institute Paris Foreword by Esmond R Long M D Ph D Sc D, Director and Professor of Pathology University of Pennsylvania Director of Medical Research National Tuberculosis Association Philadelphia Pa 448 pages illustrated Charles C Thomas Publisher Springfield Ill 19 3 Price $12 50

This is not a textbook but rather a scholarly monograph which will be of limited but valuable use in the field of research An excellent, highly specialized treatise, it is not intended for the beginner The 5 chapters presented in logical sequence, are written as a *review of the literature* and include an extensive well documented bibliography While the complete documentation may detract somewhat from the book's readability, it affords a rapid means of further investigation into any of the problems presented Over 300 foreign titles are included, many of which probably will not be available in small libraries

The chapter on nutrition and growth covers carbon and nitrogen utilization as well as that of the essential mineral elements It was particularly gratifying to find in the following chapter, a comprehensive discussion on the utility of depth cultures in studying the metabolic processes of *Mycobacterium tuberculosis* This chapter is concerned mainly with the practical aspects of growth in various complex and synthetic media The section on respiratory exchanges presents much valuable information and places particular emphasis on the use of molecular oxygen Much of what is known about the enzymes of the tubercle bacillus

eral properties of enzymes precedes the information regarding the tubercle bacilli and seems out of place in a monograph directed to advanced investigators The book closes with an excellent discussion of the products of catabolism and anabolism of tubercle bacilli The exact procedures for isolation of many of these products are cited

The well qualified authors have made judicious use of tables and graphs to clarify confusing problems In many instances parallels and differences that exist between other micro-organisms and the tubercle bacillus are described The authors have succeeded in their expressed desire to carefully prepare a useful book for the greatest number of investigators and not solely for some specialized biochemists A definite contribution has been made to this field of endeavor

—Lt Comdr G M Moore MSC USNR

Contact Dermatitis by G g L W *Idbitt* M D F A A A F A C A F I A A F A C P S or Phy H pe H p tal Ch f f D on f All gy A ta t Phy ia Gra H p t l Ch f f All gy Cl Form ly Dir tor f All gy Cl Ch ld H p tal of M ch g Form ly Con l All g St Mary s H p tal d N rth E d Cl D t t M h Am L tu S P bl t on N 133 A Mon gr ph th B nn ton D of Ame L rur D mat l gy d t d by *A th* C C *t* M D Ch irma D p tm f D ma l gy d Syph l l gy U y f M h g A A bo M h 218 pag ll t d Ch l C Thoma P bl h Spr gf ld Ill 1953

The author of this volume is an allergist who has worked closely for many years with dermatologists on questions of mutual interest He stresses the study of patterns of distribution of contact dermatitis as an aid in determination of the causes The chapter on therapy contains many important details which are frequently overlooked

There is a glossary of terms for the use of nonmedical readers because it may be desirable for the patient with a chronic dermatitis to read parts of the monograph He must have as much knowledge as possible concerning his condition in order to cooperate effectively with his doctor in the search for the causes of the contact dermatitis The author aptly states that this is one of the most intricate detective tasks with which physicians are confronted

The book is well illustrated and contains an extensive bibliography with 210 references The book should be of equal interest to the general practitioner and to the specialist in any field This monograph is highly recommended

—Lt Col J S Rice MC USA

FOOT CONDITIONS AND BOOTGEAR IN COMBAT[1]

SYLVAN L. WEINBERG Captain, MC, USAR
CLIFFORD W. ULRICH Captain, MC, USAR
KENNETH D. ORR Lieutenant Colonel, MC, USA

A FUNCTION of the Cold Injury Research Team of this laboratory while investigating cold injuries in Korea during the winter of 1951-1952, was to study the effects of the shoepac and insulated rubber boot with respect to tissue changes of the feet. A survey was made in March 1952 among a sampling of infantrymen from 3 United States regiments in Korea to gain specific information concerning bootgear and the efficacy of the new formula A anhidrotic foot powder.[2]

During the winter of 1951-1952, a new type of combat boot was used by frontline troops under the wet cold environmental conditions in Korea. This boot, known technically as the "boot, combat, rubber insulated" employed the vapor barrier principle and provided a synthetic wool layer separating 2 sealed rubber layers. Insulation thus achieved seemed superior to previously available combat bootgear. The new boot was considered an effective means for preventing cold injuries, but shortly after its introduction in Korea, it was found to increase erythema, hyperhidrosis, tissue maceration, and fungus infection of the feet. If foot hygiene was poor and socks were changed infrequently, or if boots were worn continuously for 48 hours or more, erythema, tissue maceration, and hyperhidrosis produced an incapacitating foot syndrome marked by tenderness of the feet so that walking was painful. There was a livid discoloration of the feet with wrinkling and softening of the skin. Tissue maceration in some soldiers was severe enough to cause denudation of extensive plantar skin areas. Superimposed fungus infection complicated the condition in many cases and caused difficulty in distinguishing the sequelae due to the use of the boot from the effects of the infectious process.

During January 1952, a United States infantry battalion of 700 men in a reserve area underwent training involving 3 days of

(1) Army Medical Research Laboratory, Fort Knox, Ky. Captain Weinberg is now stationed at U. S. Army Hospital, Fort Jay, N. Y., and Captain Ulrich, U. S. Army Hospital, Fort Knox, Ky.

(2) Aluminum hydroxide gel 3%, bismuth subgallate 7%, petrolatum, lanolin, aluminum sulfate 10%, diethyl phthalate 3%, oxyquinoline sulfate 5%, and powdered talc 72%.

TABLE 1 *S bj t mp on f th l t d b t*

R g m	N mb f me	N mb wi h t mpl	E w g	M l l m- pl	C mpa f h l t d b t w h h h pa					
					Sw t g			F t d mf		
					Mor	L	S m	M	L	S m
14 h	48	8	35	5	40	1	7	1	22	25
27th	73	36	34	3	52	7	14	24	19	30
35 h	74	16	54	4	55	6	13	13	26	35
T tal	195	60 (30 8%)	123 (63 1)	12 (6 1%)	147 (75 4%)	14 (7 2%)	34 (17 4%)	38 (19 5%)	67 (34 4%)	90 (46 1%)

extensive marching and long periods of [illegible] new insulated boot. The men had no experience [illegible] boots and practiced foot hygiene. Fewer [illegible] than 12 percent of the 700 men [illegible] syndrome previous[ly] [illegible] fungus infection.

METHODS AND MATERIAL

Two hundred and eighty-one men (1[illegible] 27th and 115 from the 35th Infantry Regiment) were interviewed concerning their impressions of the insulated rubber-bottom boot. The men of the 14th Infantry were interviewed and examined at their battalion rear areas within 2 hours after arrival from frontline positions; those of the 27th Infantry were seen at their regimental reserve area and those of the 35th Infantry were seen at a shower point immediately after their arrival from positions on the main line of resistance. During the interviews their feet were examined for gross evidence of epidermophytosis, [illegible] hyperhidrosis and tissue maceration. No effort was made to grade the severity of the epidermophytosis, the diagnosis of which was based on the presence of scaling and erythema. Errors in diagnosis were unavoidable but it was believed that the general trend of the incidence of fungus infection was established. Hyperhidrosis, maceration and erythema were graded as mild, moderate and severe. This rating is not given in the tables, but for the purpose of statistical analysis only the presence of the respective conditions was considered.

RESULTS

Subjective impressions of the insulated boot. It was our impression that the subjective response of the troops to the boot generally was favorable (table 1). Many of the men who complained of excessive sweating and foot discomfort still preferred the new boot because of its greater warmth and water repellent qualities. Some thought that the foot irritation decreased after their feet became accustomed to the boot.

Many of the complaints registered arose because the boot was worn during relatively mild weather which aggravated the sweating of the feet. A subjective impression of an increase in sweating does not constitute proof that sweating was increased. Consciousness of sweat may have been more marked because there was less absorption of sweat by the single pair of wool socks and none by the rubber lined boot interior as compared with the absorption by 2 pair of heavy ski socks and felt insole worn with the former.

TABLF 2 *l c d f p d m phyt m g 281 mb t ld d g t typ f b tg w rn K 1951 1952*

B tg w t t m f m t o	M wh h d wo l t d b			M wh h d t w l t d b t		
	N mbe f m	E d f p d m phyt		N mb f m	E d f p d m phyt	
		N mb	P		N mb	P c t
I l t d b t	146	65	44 5**	0	0	0
Sh ep (t bb)	0	0	0	64	19	29 7**
L th b t	49	21	42 9**	22	4	18 2**
Tot l	195	86	44 1**	86	23	26 7**

I l d 73 ld f m h 27 h R g m m g wh m 30 had d f p d m phyt
S ld m d mm d ly f 1 f m f l p

Condition of the feet

1 Epidermophytosis (table 2) A comparison of the percent who had epidermophytosis who had worn the insulated boot with those who had worn the leather combat boot did not reveal a significant difference The difference in the incidence of epidermophytosis in the group who had and had not worn the insulated boot, however, was significant. The inference was that wearing the insulated boot contributed significantly to an increased incidence of epidermophytosis This inference was further strengthened by the fact that 73 soldiers examined from the 27th Infantry (table 2) had worn the new boot either at examination or shortly before The 27th Infantry was the only regiment of the 3 studied which was in regimental reserve area at the time of the survey In this area, where opportunities for proper foot hygiene were better than at the frontlines the 73 men who had worn the insulated boot still had a higher incidence of fungus infection than the 86 men in combat who were wearing the shoepac or the leather boot

2 Erythema, hyperhidrosis, and maceration Tables 3 and 4 summarize our findings and our interpretation of them Whatever effect the insulated boot may have had in the production of hyperhidrosis and maceration, it was reversible by changing to the leather boot for several days The minimal period required has not been determined but it was apparent that erythema persisted longer than the other findings after the change from the insulated boot to the leather combat boot. The significance of this was not entirely clear but it may be postulated that because erythema was the earliest finding to appear when the insulated boot was worn it may also be the last to disappear in the reversal of the process The residual finding of erythema and fungus infection, the latter a more chronic process, persisted for an undetermined period even after removal of the new boot.

Of the 281 men included in this study, 33 (11 7 percent) were Negroes (which was consistent with the percent of Negro troops in the Eighth Army as a whole) but the number of Negro troops examined was too small to permit statistical comparison of incidence of the various phenomena described on a racial basis

Subjective evaluation of the formula V foot powder is shown in table 5

SUMMARY AND CONCLUSIONS

Frontline soldiers from the 3 regiments of a United States infantry division were examined in Korea in March 1952 for sequelas following the wearing of the new insulated rubber boot and for the subjective reaction of the men to the boot Comparison was made with other standard bootgear Although 147

TABLE 3 *I d f hyp h d m t n, d ryth m m ng 195 omb t ld who h d w rm th w l t d rubber*
b t a d m g 86 mb t ld wh h d t w th w l t d rubber boot K 1951 1952

Foo g w	N f m	Hyp h dr				Ma				E y h ma			
		N	M ld	Mod	S	N	M ld	Mod ra	S	N	M ld	Mod ra	S
M wh had w n h ul t d b (g p 1) l la d b t w t m f xam na	146	90	41	13	2	90	26	27	3	66	54	21	5
		(627)	56 (38%)			(62%)	56 (38%)			(45%)	80 (55%)		
C mba b w t m f m na	49	40	8	0	1	44	4	0	1	31	17	0	1
		(827)	9 (18%)			(907)	5 (107)			(63%)	18 (377)		
S b l	195	130	65			134	61			97	98		
M wh had wor h i l d b (g p 2) Shoepa wor m f m na i	64	55	7	1	1	55	8	0	1	54	7	2	1
		(86)	9 (14)			(86)	9 (14%)			(84)	10 (16%)		

TABLE 3 *Incidence of hyperhidrosis maceration and erythema among 195 combat soldiers who had worn the new insulated rubber boot Korea 1951-1952—Continued*

boot and among 86 combat soldiers who had not worn the new insulated rubber boot

Footgear worn	No. of men	Hyperhidrosis				Maceration				Erythema			
		None	Mild	Moderate	Severe	None	Mild	Moderate	Severe	None	Mild	Moderate	Severe
Men who had not worn the insulated boot (group 2) (cont'd)													
Combat boots at time of medical examination	22	21	1	0	0	21	1	0	0	18	3	1	0
		(96%)	1 (5%)			(96%)	1 (5%)			(82%)	4 (18%)		
Subtotal	86	76	8	1	1	76	9	0	1	72	10	3	1
		(88%)	10 (12%)			(88%)	10 (12%)			(84%)	14 (16%)		
Total	281	206	75			210	71			169	112		

Column a in table 4
Column b in table 4

TABLE 4 *Compa f t d d d v t of p t t bl 3*

		b	D ff S D	I f
S 1 G p l P t w th hype h d I t wi h ma P t w th ryth m	38 3 38 3 54 3	18 4 10 2 36 7	2 9 4 8 2 2	P t l m d b g f ly d ff t (Cha g f m h l d b h mba b f w d y p or am d d g f ly h d f hyp h d ma ra d y h ma)
S 2 G p 2 P w h hyp h d P t w h mac t P w h e yth ma	14 1 14 1 15 6	4 5 4 5 18 2	1 5 1 5 0 27	P l m d b t g f ly d ff (Th wa g f d ff t c h d f hyp h dr i ma d y h ma s ld w g h b p d l h mba boo wh had w h i l d bbe b)
S 3 T bl 3 P w h hyp h d P w h ma P wi h yth ma	G p l b 18 4 10 2 36 7	G p 2 nd b 11 6 11 6 16 3	D ff S D 1 1 0 25 2 7	D ff pe t for hyp h d i d ma ra f yth ma s g f ly d ff g f Th (R pl f h nsul d boot w h th J h mba b p xa mina d d h d f hype h d d ma ha oop wh had w h ul d boo Th d f yth ma h w ma d ig f ly h gh r)

TABLE 4 *Comparison of standard deviations of percentages in table 3*—Continued

		b	Difference S.D.	Significance
Section 4 Table 3	Group 1	Group 2 and b		Percentages in groups 1a and 2 and groups 2 and 2b are significantly different
Patients with hyperhidrosis	38·3	11·6	5·1	(The incidence of hyperhidrosis maceration and erythema was significantly higher in the group with tight fitting boots at examination as compared with those wearing the loose fitting hoepac or the leather combat boot which had been worn and rationed boot)
Patients with maceration	38·3	11·6	5·1	
Patients with erythema	54·7	16·3	6·8	

TABLE 5 *Subjective impression of formula V foot powder*

Regiment	Number of patients	Complaints		Sweating reduced	No benefit
		Caking	Miscellaneous		
14th	67	10	1	50	15
27th	58	7	2	43	14
35th	84	14	3	70	12
Total	209	31 (14·8%)	9 (4·3%)	163 (77·9%)	41 (19·6%)

of the 195 men believed that the new boot increased the sweating of the feet the general subjective reaction to it was highly favorable

The incidence of epidermophytosis, hyperhidrosis maceration and erythema was significantly higher in men wearing the insulated boot than in those wearing the shoepac or the leather combat boot Significantly higher incidence of epidermophytosis and erythema persisted even when the insulated boot had been replaced by the leather combat boot a few days prior to examination No effort was made to compare the benefits of the new boot in withstanding severe wet cold environments against the adverse sequelas which occur from wearing the boot under other conditions

Careful attention to foot hygiene daily change of socks avoidance of prolonged uninterrupted wearing of the boot and interdiction of the use of the boot under warmer weather conditions are essential to the optimal performance of the Army insulated rubber boot If these principles are disregarded a temporarily incapacitating syndrome consisting of tenderness pain erythema hyperhidrosis and maceration may develop An increased incidence of fungus infection may be superimposed or occur as an isolated finding

Interrogation of 209 troops who had used the formula V foot powder gave some evidence of its effectiveness in reducing sweating of the feet

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ADDENDUM S m 200 U t d Stat troop f m v l oth F ghth A my t w int rv wed t m b l army urg l hosp l g th ir g r l mp on f th ns l t d b t d th f h d ot f ot p wd Th u w th t th w boot w mor mfortabl h th hoepa that t aff d d b r p t t ga st ld d h t wa m d s bl p t f th pp t a hype h dr A oc l ld r mpla d th t th p f th b ot bbed g t h l g b t n t n f f t p od d n th ma was b e d Among h me g o p of m t wa ppa t that th f foot powd wa p d Th powde w n t alway labl nd k g f t w f q t ompla t A b g t on d s ff s odor f th f t w s oc l ompla Some b l ev d th t th w f m l V powd w mor ff t tr ll g w t g th n th powd p ou ly us d

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BOOK RECEIVED

H t logy by *A th W th Ham*, M B F R S C P f or of A tomy in Cha g f Hi t l gy t th F lt f M d d D nt try U ty f Tor t T onto Ca da 518 f gur mbe incl d g 7 pl t lor 2d d t on 866 pag s J B L pp tt C Ph lad l ph P p bl sh 1953 Pr $10

LOEFFLER'S SYNDROME[1]

LLOYD J GREGORY *Captain MC USA* (2)

LOEFFLER (3, 4) has described a transitory pulmonary disease characterized by (1) mild, clinical manifestations, (2) fleeting, migrating pulmonic infiltrations on the roentgenogram, and (3) eosinophilia By 1940 about 100 cases had been reported Clinically, in one third of the patients, there are no signs or symptoms, and the condition is found on routine radiography Symptoms when present, include slight fatigue, general malaise, and an irritating cough productive of a slight amount of yellow, mucoid sputum which is poor in cells and contains a few eosinophils Occasionally pain in the chest is present The temperature may be normal or moderately elevated, and the leukocyte count may be as high as 15,000 with from 6 to 66 percent eosinophils The sedimentation rate may be as high as 15

Loeffler described the following types of roentgenographic shadows (1) large, irregular opacities which may be fleecy or dense, unilateral or bilateral, (2) small infraclavicular infiltrations, (3) circular shadows, single or multiple, unilateral or bilateral, (4) sharply defined densities situated at the margins of a lobe and (5) abnormal shadows in the vicinity of the hilum, simulating hilar enlargement Occasionally there may be an associated pleural effusion These shadows disappear in from 3 to 8 days In from 5 to 8 percent of the patients with this syndrome there was a history of asthma Loeffler did not ascertain the cause of the disease (which he discovered in a Swiss tuberculosis sanatorium), but believed that the pulmonary lesion was a specific tissue reaction probably produced by a variety of antigens and comparable to erythema nodosum

It now appears however that the syndrome is of greater complexity and variety than originally described by Loeffler Some other varieties (tropical eosinophilia (5), eosinophilic pneumonia allergic pulmonary infiltrations, et cetera) have been

(1) Adapted f m rt l p bl h d Th Surge n Circular L tte FECOM A g 1951

(2) F tz mo Army H p tal D t Col

(3) L ffle W Zur D ff nt l Diagn d r Lungen nfiltri ru ge be fl chtig Su d m-I f ltr (m E noph l) B tr kl d Tub k 79 368-382 1932

(4) Loffl W D e fl htig Lungeninfilt te m t Eo ph lie Schweiz m d Wchns hr 66 1069-1078 No 7 1936

(5) G g E D W O trop cal os ophilia sociat d w th p lm na y s gn (Loeffler yndr me) J T op Med 48 149-151 D 1945) 1946

described by other authors and although they differ in some respects from the original description, they basically appear to be the same syndrome I recently reviewed the causes of so-called tropical eosinophilia that may be associated with Loeffler s syndrome It can be caused by ancylostomiasis ascariasis trichinosis schistosomiasis (japonica) echinococcus cysts clonorchiasis amebiasis oxyuriasis paragonimiasis strongyloidiasis and tapeworm infestation Because of the great prevalence of the above named parasitic diseases and chronic asthmatic bronchitis in Korea I undertook this study of Loeffler s syndrome

PATHOGENESIS

Wilson and Alexander *(6)* suggest that hypersensitive reactions may be reversible as is Loeffler s syndrome or nonreversible as is periarteritis nodosa There is a transition from the former to the latter in some instances and such a transition is similar to the Arthus phenomenon in rabbits which is a local edema or necrosis following subcutaneous injection of a specific antigen in a previously sensitized animal

Harkavy *(7)* suggested that any tissue might be involved in the allergic response and that the degree of involvement and the shock tissue" affected determines the clinical syndrome Although an allergic background suggests a link between the severe and mild cases views regarding the allergens which cause Loeffler s syndrome vary

Engle *(8)* observed patients with privet cough in China in May and June coincident with the flowering of the privet He himself contracted the condition and roentgenograms of his chest revealed massive pulmonary consolidations which cleared completely after 1 day on 1 occasion and after 6 days on another At the same time his eosinophil count was from 20 to 30 per cent and he ascribed his condition to sensitization to the privet pollen Wright et al *(9)* observed pulmonary consolidation in 24 of 268 asthmatic soldiers They pointed out that atypical virus pneumonia probably existed in 10 of these 24 patients because of the presence of fever and systemic illness along with an eosinophilia

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(6) W l K. S d Al xand H L R l f pe ta od br n-
hial hma nd oth forms f h ma hype ns ve J Lab & Cl Med 30
195 203 Ma 1945

(7) Ha kavy J V la ll gy path g f br nchial hma w h urr
pulm ry nf l ra nd ph l poly os Ar h l Med 67 709-734
Ap 1941

(8) E g l D Ube g na g naphylak h E kr k ng d L g Be
Kl d T be k 87 239-250 1935

(9) W gh D O G ld E M. d J nn ng G In d f p lm nary ns l
d T ns m ld thma S h M J 39 908-912 N 1946

Swiss observers have sought to implicate *Ascaris lumbricoides*, having observed migrating pulmonary shadows in association with infestation by this helminth. Perlingiero and Gyorgy *(10)* reported a 2 year-old boy with chronic eosinophilia, anemia, and transient pulmonary infiltrations. He also had reversible local necrosis of the liver in the presence of ascariasis. The above symptoms and signs all disappeared when hexylresorcinol and methionine were given.

Wright and Gold *(11)* reported 9 patients with Loeffler's syndrome in a series of 26 patients with creeping eruption. Hoff and Hicks *(12)* described a patient in whom asthmatic attacks and infiltrations of the lungs disappeared with the discovery and treatment of an amebic infection. Elsom and Ingelfinger *(13)* described 2 patients with extensive, multiple exudative lesions of the lungs and eosinophilia associated with *Brucella abortus* infection. In India, a mite has been isolated from the sputum of some patients and some authors regard this as an etiologic agent, because a cure results from treatment with carbarsone.

PATHOLOGY

Von Meyenburg's *(14)* report of 3 soldiers accidentally killed is open to question because he did not furnish proof of the transient nature of the pulmonary lesions, but he was the first to report on the lesions of Loeffler's syndrome. The outstanding histologic features of the pulmonary lesions in those patients who come to autopsy are the large numbers of eosinophils in the pneumonic exudate. There is also the advanced organization of the exudate with fibrosis and giant cells, the presence of peculiar granulomatous lesions, and the occurrence of necrotizing arteritis and phlebitis, which histologically appears quite similar to the change observed in periarteritis nodosa. According to Baggenstoss et al *(15)*, these pathologic findings suggest an underlying allergic basis for Loeffler's syndrome. Wilson and

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(10) Perl, g J G d Gy gy P Ch osin ph l p t of c with cr of l et p lmo ry f ltr t s mia nd asc af t t n Am J Di Ch ld 73 34 43 J 1947

(11) W ght D O nd G ld E M. Loeffl yndr me ociat d with cr p ng up (ta us h lm th) J A M. A 128 1082 1083 A g 11 1945

(12) H ff A d H k H M. T t p lmonary f ltrat s ca e with eosi o- ph lia (L ffl yndr m) a oc t d w th Amoebiasis Am R v T berc 45 194 199 F b 1942

(13) El m K A nd Ing lf g F J E philia and p e m t s n chr ic b ll s r p f s A Int M d 16 995-1002 May 1942

(14) on M y burg H D s s noph l L g n nf ltrat p thol g sche Anatom d P th g S hw iz med Wch hr 72 809-811 J ly 25 1942 bst a ted J A M A 121 626 F b 20 1943

(15) B gg nst A H B yl y E C a d Lindb g D O N L ffl syn- dr m po t f w th path l gi minat f l ngs P o St ff M et Mayo Cl n. 1 457 465 N 27 1946

lexander *(6)* in a review of 300 cases from the literature found that 18 percent of the patients who had periarteritis nodosa had bronchial asthma An autopsy was performed on 4 of Harkavy s *(16)* 16 patients with bronchial asthma and Loeffler s syndrome Acute arterial lesions varying from simple thickening of the intima to acute necrotizing arteritis and endarteritis obliterans were found

Experimental injection in animals of foreign protein in the form of specific and nonspecific antigens have produced eosinophilia Herrick in 1913 produced eosinophilia by injecting a suspension of ground ascaris into guinea pigs Other methods are by sensitization to haptens such as those present in hydantoin and sulfonamides Rich and Gregory *(17)* drew attention to the fact that erythema urticaria purpura arthritis transient paresis myocarditis pericarditis focal swelling and degeneration of collagen tissue eosinophilia and necrosis with inflammation of arteries are common both to rheumatic fever and to anaphylactic reactions of humans with experimental serum sickness " They considered the pulmonary lesions of rheumatic fever and those resulting from anaphylactic hypersensitivity as basically identical They found that histologic lesions occurring in rheumatic pneumonitis and pneumonitis resulting from hypersensitivity to sulfonamides to be the same and to be characterized by capillary damage They further pointed out that clinically and experimentally the sharply focal vascular lesions of periarteritis nodosa can be produced by foreign antigen in the blood stream of the anaphylactically sensitized body

The expression on the part of the body or a particular tissue in the body to a state of allergy hyperergy or hypersensitivity may assume many forms Why there is this variety of response is not known "Why eosinophils are not present in all cases of anaphylactic pneumonitis is paralleled by the fact that they are present in some but not all anaphylactic urticarial lesions Why his type of eosinophilic pneumonitis does not occur in all cases of acute rheumatic fever remains as obscure as why urticarial or vascular lesions of the periarteritis nodosa type occur in some but not all cases of rheumatic carditis Or why hypersensitivity to a given pollen causes asthma in some patients hay fever in others and in some both of these condition *(17)* Therefore the consensus that the eosinophils are produced only by the bone marrow as first postulated by Ehrlich in 1880 can be superceded by the possibility that they may arise in local tissues as well

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(16) Harkavy J V l ll gy III J All gy 14 507 537 N 1943
(17) R h A R d G g y J E On naphyla nat f h ma p o B ll J hns H pk H p 73 465 478 D 1943

Although eosinophilic granuloma of bone with pulmonary manifestations may simulate the somewhat chronic forms of Loeffler's syndrome described above, it is probably not a manifestation of human hypersensitivity as Loeffler s syndrome is thought to be The condition was called eosinophilic granuloma of the lung" by Farinacci et al *(18)* who stated that "Parkinson suggested the possibility of pulmonary infiltration occurring as the sole manifestation of the chronic form of eosinophilic granuloma" In their 2 patients, there was no evidence of coexistent osseous or other extraosseous manifestations of eosinophilic granuloma other than those in the lungs "Farber *(19)* and Green and Farber *(20)* were the first to postulate that eosinophilic granuloma, Hand Schuller Christian disease, and Letterer-Siwe disease represented variations in degree, stage of development, and localization of the same basic disease process Most authors who have since written on eosinophilic granuloma of bone have accepted this point of view" *(18)*

Herbut and Kinsey *(21)* succeeded in producing in rabbits a condition similar to Loeffler s syndrome in man except that there was no eosinophilia and the pulmonic shadows were not migratory They stated that "sensitized animals were given single or multiple intratracheal instillations of horse serum They presented only slight clinical disturbances," such as snorting and sneezing "Roentgenographically they revealed transitory pulmonary infiltrations that cleared in from 7 to 13 days there were eosinophils in the tracheal secretions and pathologically there was congestion, edema, and eosinophilic infiltration of the submucosa of the trachea and the bronchi and in the lung parenchyma there was congestion, edema, atelectasis, emphysema, and an eosinophilic pneumonia"

DIFFERENTIAL DIAGNOSIS

Eosinophilia is a feature in the following diseases, and should be ruled out before a diagnosis of Loeffler s syndrome is made

1 Pruriginous diseases of the skin with repeated excoriations such as dermatitis herpetiformis and lymphoblastomas (mycosis fungoides prurigo and atopic eczema)

2 Diseases of the skin with excessive destruction of tissue such as pemphigus

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(18) F na C J J ff y H C d L k y R E Eo ophil c gr n l m f l g port f 2 ca U S Arm d F c M J 1085 1093 J ly 1951

(19) F be S Natur t l t ry or e ophil gran loma f bo Am J P th 17 6 5-626 1941

(20) G W T nd F ber S E sin philic o olit ry g n loma f b J Bo & J t Surg 24 499-526 J ly 1942

(21) H b P A nd J ey F R Tr nsitory p lmonary infilt t (Lo ffl ynd m) rabb t Ar h P th 41 489-502 May 1946

3 Blood dyscrasias such as Hodgkin s disease eosinophilic leukemia myelogenous leukemia and familial eosinophilia

4 Drug reactions including those due to phenylethylhydantoin benzene derivatives and digitalis

5 Allergic diseases such as urticaria and asthma

6 Probable allergic diseases such as periarteritis nodosa and Loeffler s syndrome

7 Miscellaneous diseases and states such as splenomegaly plenectomy ingestion of raw liver intestinal parasites trichinosis ultraviolet and x ray irradiation chronic brucellosis and tuberculosis

Translucent annular roentgenographic shadows such as those seen in Loeffler s syndrome are seen in patients with (1) emphysematous pleural blebs or bullas (2) bronchiectatic dilatation of the bronchi (3) localized pneumothorax (4) pyogenic pulmonary infection, (5) various cystic diseases (6) viral pneumonia (7) pulmonary coccidiodomycosis and (8) breakdown of the neoplastic tissue of pulmonary tumors

DISCUSSION

European writers have reported patients with Loeffler like syndromes which run either a severe rather septic clinical course for several months or a clinically mild but chronic course for periods up to 7 years The duration and severity of the migrating transient pulmonary shadows and eosinophilia in these patients is unlike the Loeffler syndrome as originally described

Grayce s (22) patient suffered from constant bronchospasm and sporadic asthmatic attacks with typical pulmonary and other findings of Loeffler s syndrome for 2 years Elkoles and Butler (23) reported a patient with a right apical pulmonary cavity associated with eosinophilia with no evidence of past or present tuberculosis The patient had a negative skin test with old tuberculin and repeated sputum tests were negative for acid fast bacilli Although the cavity was strongly suggestive of tuberculosis its rapid and complete disappearance simultaneously with the apical transitory and other pulmonary infiltrations stimulated the authors to postulate that nontuberculous pulmonary cavitation may occur in Loeffler s syndrome The prominent features of the 6 patients who had allergic pulmonary infiltrations" with eosinophilia described by Hansen Pruss and

(22) G y l Pulm nary f ltr t ia d w h blood ph lia Clin. Proc 5 195 206 J ly 1946

(23) Elk l A nd B tl N R T ns ory pulmonary f ltr t ns d p l ia oci d w h ph lia B J R d l 19 512 517 D 1946

Goodman *(24)*, were persistent severe asthma, lack of response to antibiotics and sulfonamides, and a history of frequent upper respiratory infections. In these patients, the asthma persisted until the pulmonary consolidations, which were transient and migratory, cleared.

Harkavy *(7)* reported 8 patients and later *(16)* added 8 more with recurrent pulmonary infiltrations and eosinophilic polyserositis. All but 1 of these 16 patients had asthma and all had sinusitis. About 70 percent had positive skin reactions to pollen and food allergens. Their leukocyte count varied from 14,000 to 40,000 and their eosinophilia from 17 to 84 percent. The condition was considered to be a sensitization or allergy to non-specific bacteria emanating from chronically infected sinuses in constitutionally allergic persons as well as in those who acquired the allergic response.

Coincident with the asthmatic attacks, Harkavy's patients also developed pulmonary infiltrations, followed by electrocardiographic changes and sterile pleural effusions containing up to 100 percent eosinophils. Pericardial effusion was present in 1 patient and was succeeded by urticaria and polyarthritis which was not considered to be of rheumatic origin. Some patients had peritoneal eosinophilic ascites, and 1 purpuric patient on biopsy proved to have eosinophilic granuloma of the skin. The above-mentioned signs were transient and disappeared with the termination of the asthmatic seizures, only to recur with their recrudescence. One patient differing from the others only in severity, proved on autopsy to have had periarteritis nodosa.

Harkavy's patients differ from Loeffler's in the more prolonged duration of their pulmonary infiltrations and the presence of large effusions which had to be aspirated. This suggests that (1) the infiltrations represent hyperergic foci of response in which the interalveolar capillaries, the larger vessels and associated mesenchymal structures participate as "shock" organs, and (2) the edema and cellular filtrate are comparable with the purpura, urticaria, angioneurotic edema, et cetera occurring elsewhere in allergy.

The exact function of the eosinophil is not known. The work of Selye *(25)*, Thorne *(26)* and others demonstrated that eosinophil counts before and after stress phenomena or cortisone therapy are good indications of adrenal cortical function. It would

(24) H ns n-P us O C d Goodma E G All rg c pulm nary co s l d t ns A n. All gy 2 85 108 Ma Ap 1944

(25) S lye H Te bo k f End logy Mo tr l Un s ty Mo tr l Qu be 1947

(26) Th G W Th Diag d T tm t f Adr nal Ins ff n y Cha l C Th ma P bl h Sp ngf ld Ill 1949

seem however, that eosinophilia develops as a result of d struction of body tissue or as a *reaction to some protein or* hapten antigen It has been shown that eosinophils are phagocytic *for bacteria trichinella and peptones* In addition it has been demonstrated that the histamine content of the blood is *high in patients with eosinophilia* This raises the question whether eosinophilia and increased blood histamine are produced by a single factor or whether the eosinophils appear as the result of stimulation by histamine It has been suggested that the eosinophilic granules have a high concentration of histamine possibly as a protective mechanism

TREATMENT AND PROGNOSIS

Because eosinophilic (Loeffler s) pneumonia occurs in allergic patients and can so often be prevented by removal of the offending sensitizing agent every effort should be directed toward identifying the antigen After eliminating foci of bacterial infection in the sinuses nasopharynx and bronchi by means of antibacterial chemo- and immuno-therapy the stool and sputum should be examined for ova and parasites and the patient treated according to the findings If the sensitizing antigen cannot be identified the prevention of recurrences and symptomatic management with epinephrine ephedrine and antihistaminic drugs can be used before secondary invasion of bacteria occurs Herbert and Rose *(7)* reported a patient with Loeffler s syndrome who was treated with ACTH and had a complete remission Pyribenzamine and benadryl are of little or no value Skin and patch tests for offending food and pollen allergens should be made if attacks of Loeffler s syndrome especially associated with asthma recur and a desensitization and elimination program instituted *(8)*

Because most cases run a benign course the prognosis is good but those associated with periarteritis nodosa or disseminated lupus erythematosus have a poor prognosis Almost any tissue may be affected and the condition may be so mild as to pass unnoticed or so severe as to cause death

CONCLUSIONS

There is a variety of clinical manifestations of varying severity and duration with Loeffler s syndrome at one extreme and periarteritis nodosa at the other Transitory pulmonary infiltrations eosinophilia bronchospasm a state of hypersensitivity to a variety of agents and a pathologic reaction including

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(27) H bert P nd R B Ob rva ns ff f ACTH f Loeffl yndr me d f tr p l in ph l J All gy 20 79 F b 1949

(28) Alphe I M. Loeffl yndr me p rt o tw ca on w b urt rt f ur nd ocia d w h hay f r J All gy 18 39-46 J 1947

vascular damage, edema, and cellular infiltration are manifestations common to both. Eosinophils may be found in great numbers in the blood stream or only locally in the tissues affected. This eosinophilic reaction in Loeffler's syndrome appears to be determined by the varying sensitization of blood vessels, and the clinical findings are determined by the character and combination of lung tissues involved.

BOOK REVIEWS

The Roentgen Aspects of the Papilla and Ampulla of Vater by *Maxwell H. Poppel* M.D., F.A.C.R., Professor of Radiology, New York University Post-Graduate Medical School; Director of the Roentgen Ray Department, Bellevue Hospital; Consultant in Radiology, Veteran Administration Hospital, Bronx, N. Y.; Consulting Radiologist, United States Naval Hospital, St. Albans, Long Island; Roentgenologist, New York University Hospital; *Harold G. Jacobson* M.D., F.A.C.R., Director, Department of Roentgenology, Hospital for Special Surgery; Associate Clinical Professor of Radiology, New York University Post-Graduate Medical School, New York, N. Y.; Attending in Radiology, U. S. Veterans Administration Hospital; Formerly, Chief, Radiology Service, U. S. Veterans Administration Hospital, Bronx, N. Y.; and *Robert B. Smith* M.D., Senior Resident in Radiology, Veterans Administration Hospital, Bronx, N. Y. 195 pages, illustrated. Charles C. Thomas, Publisher, Springfield, Ill., 1953. Price $8.50.

The authors present a very comprehensive discussion of a very limited but important field in roentgen diagnosis. A thorough discussion of the embryologic development and anatomy of the structures concerned is presented from the standpoint of the anatomist and of the roentgenologist. Special roentgenographic and microscopic studies are presented on the normal Vaterian segments from more than 100 autopsies and also from many surgical specimens and autopsies of patients with Vaterian disease. There are interesting and instructive chapters on the congenital variants of the papilla, ampulla, ducts and adjacent structures, roentgenographic manifestations of disease of the Vaterian segments and differential diagnosis between diseases of this segment and diseases of adjacent structures giving a similar appearance. Most of the entities described are illustrated by representative roentgenograms.

This book is of particular value in calling attention to a small, but important segment of anatomy in which relatively minor changes in the roentgen appearance, that can be easily overlooked in routine studies, may signify serious disease. It is of

particular interest to anatomists and radiologists The first half is of value as reference material and also represents much fundamental investigative work of normal anatomy of this segment The last half is of greater interest to the clinician and radiologist —*Col P O Wells MC USA*

T m of th Orb t d All d P d T mo A A ly f 216 C H tor by *R ym d G I g ll* M D F rm ly I tr ct Oph h lm l gy C ll g f Phy d S g C l mb U r ty Form ly A Ophthalm l g t P by H p l d V d b lt Cl Form ly A t t Ey P h l g t I tut f Ophthalmol gy P byt H p tal th C ty f N w Y k 410 p g 153 ll ra on Ch l C Th ma P bl h Spr gf ld ll 1953 P c $11 50

In this concise well organized textbook the author has presented a detailed thorough analysis of 216 cases of orbital tumors placing them into 27 different types This alone represents an immense collection of clinical material afforded only by large institutions which are staffed by specially qualified physicians who attract unusual cases from wide areas in sufficient quantities to permit studies which afford valuable data for publication He has utilized this careful study to provide for the clinician who encounters only an occasional orbital tumor This statistical data covers the types of tumors which involve the orbit the frequency in which each specific type is encountered the age sex association with general diseases and important points relative to the diagnosis of each type Diagrams show the region of the orbit involved by each tumor The case histories briefly and clearly substantiate the discussion in each specific chapter which includes recent views from current literature covering orbital tumors and allied pseudo-tumors There is a discussion of the methods of treatment which is of importance to the clinician who is faced with an occasional orbital tumor

The author has considered mixed tumors of the lacrimal gland as carcinomas This is a forward step in textbook presentation in view of the present-day concept presented in current literature The use of the term carcinoma expresses the serious nature of these tumors far better than the confusing term mixed tumor

This textbook represents a wealth of material which has been carefully analyzed and clearly and briefly presented It is a valuable source of information to both the clinician and the pathologist and should become a useful reference book in their libraries —*Col M J Reeh USAFR (MC)*

NONGONOCOCCAL URETHRITIS IN KOREAN ROTATEES

ROBERT D CROUCH *Lieutenant MC USNR (1)*
JAMES E PEESE Jr *Hospital Corpsman, first class USN*
HAROLD J BOUDREAU *Hospital Corpsman, second class USN*

NONGONOCCOCAL urethritis has been an increasing problem among servicemen in the Far East since the end of World War II, as reported by Graham (2) and by Bebione and Graham (3) It has become more than twice as prevalent as gonorrheal urethritis and one-third more prevalent than gonorrheal urethritis and penile ulcerative lesions combined. An important but unanswered question is what may be the future residual effects, if any, of these prolonged and recurrent urethral infections

The purposes of this article are (1) to emphasize the importance and prevalence of nongonorrheal urethritis, (2) to report the results of the laboratory and clinical observations used in making the diagnoses and differentiating the types of urethrorrhea and (3) to discuss the treatment of choice

The observations were made and the opinions reached mainly by clinical observation and utilization of the minimal laboratory facilities available aboard a troop transport operating from Japan and Korea The patients were Korean rotatees who had spent varying lengths of time in Japan while on duty in the Far East.

CLINICAL MATERIAL

During a 7 month period in 1952, 407 men reported to sick bay with venereal complaints There were 328 cases of urethrorrhea, of which 90 were gonorrheal urethritis and 19 were of prostatic or prostatovesicular origin The remaining 219 patients were diagnosed as having nongonorrheal urethritis Of these, 156 had had previous episodes of a similar nature The other 79 men had penile ulcerations, of which 73 were diagnosed as chancroid and 6 as shallow erosions of herpes progenitalis, after ruling out primary syphilis in all cases by negative dark field examinations on 3 consecutive days

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(1) Medical Department USNS *General E. T. Collins* at time of writing now at Duke Hospital Durham, N. C.

(2) Graham R. S. Nongonococcal urethritis U. S. Armed Forces M. J. 3 401 405 Mar 1952

(3) Bebione R. W. and Graham R. S. Nongonococcal urethritis in Navy Am J Syph. 36 480 482 Sept 1952

TABLE 1 *R lt f G m t f thr l smea*

Org m	Numb r f p ti t
N er a g orrh	90
G m-p t v coc nd cocc ba ill	49
G m-n gat bac ll	14
Mix d nf ti (m nly gram-p t oc nd oc ba ll d gr m gati ba ill)	34
N org nism p nd p th L l ll	*118*
Spiroch f *B rr l a v t*	4
T tal	309

Smears of the urethral discharges were made on 3 consecutive days and stained by Gram s method The findings in regard to those patients with urethritis are given in table 1 Only 29 percent of the cases of urethritis were gonorrheal as compared with 71 percent found to be nongonorrheal Every patient diagnosed as having nongonorrheal urethritis gave a history of sexual intercourse but because in most cases many contacts had been made during the preceding weeks no incubation period could be determined.

TABLE 2 *Sympt m nd f que y 219 pat t w th g rrhe l thr t s*

Sympt m	Numb f pa
D h g	219
( ) H m g disch g ly	98
(b) Co tin us d ch g	121
Burn g ur nat	34
Itcl g ns tio	28
Pe l h g p	16
Ft que y	12
N ct ia	8
L w bd m nal or inguinal p	6
Scr l r t t l p in	2
P ur nati n	2

The symptoms presented by the patients were varied but the large number with urethral discharge as the only *symptom* seems significant (table 2) Only 64 of the 219 patients had any

symptom other than a urethral discharge, although many of these had multiple complaints Practically all of the symptoms were mild and caused the patients little concern

TREATMENT

The treatment of these patients consisted of general or constitutional measures and specific chemotherapeutic agents Without adequate treatment this type of urethritis may persist indefinitely The general measures are (1) no "milking down" of the penis, *except to obtain a specimen for laboratory examination*, (2) adequate rest and avoidance of excessive fatigue, (3) abstinence from sexual intercourse or any sexual stimulation, (4) abstinence from alcoholic beverages, and (5) drinking of large quantities of water Co-operation in these measures was excellent, inasmuch as the patients were traveling aboard an austerity-type troop transport. Also, most of the patients returning to the United States *desired a cure before arriving home* and were eager to co-operate Treatment and observation covered a period of about 2 weeks with most patients, but was recommended for from 3 to 4 weeks The number of recurrences, if any, after the patients left the ship are not known All patients with a history of recurrent attacks admitted *sexual intercourse subsequent to the first infection*

The specific chemotherapy in each case was selected according to the laboratory findings from a smear treated with Gram's stain Sulfadiazine, dihydrostreptomycin, penicillin, aureomycin, and chloromycetin were used in this study Table 3 summarizes the results obtained over the period of time these patients were observed Previous reports that neither penicillin nor sulfadiazine were of great value in nongonococcal urethritis were partially borne out by *these observations* The *combination* of sulfadiazine and chloramphenicol gave satisfactory results in the mixed infections in two-thirds of the patients The dramatic results with the use of aureomycin however, is the significant finding in this series Although Graham reported poor results with aureomycin as compared with sulfadiazine or chloramphenicol, we found aureomycin most effective This agrees with the preference of the British for aureomycin *(4)* and with the suggestion of Durel *(5)* The patients with reinfection were just as satisfactorily treated with aureomycin as those infected for the first time *Furthermore* the response was just as good in patients who had previously been treated with another agent All patients treated with aureomycin, except 4 were relieved of their urethral discharge and other symptoms at the end of 5 days' treat

(4) Q t ons d C mm t Br t. M J 2 1127 N v 11 1950
(5) Dur l P Aur my urinary t f ct ons Publ m d 21 3 1951

TABLE 3 R lt / p / th py

Spe f therapy	O g m fr m m	N mb r f p t t	R lt		
			C d	Imp v d	N ha g
Pr in p ill il 300 000 t d ly f 5 d y	G mp it c nd coccob ll	49	16	4	9
	Spir ch te f B. t	4	4	0	0
D hyd tr pt mycin 0 5 gram b d for 5 d ys	G m- g t ba ill	14	6	0	8
Sulf di 4 gr m i t lly d 1 gr m q i d f 7 d y pl chl m- ph c l 500 mg q 6 h for 7 d y	Mix d fect on (gr m- p t coc i nd gram- g t e od)	34	22	3	9
S lf dia 4 gr m i tially d 1 gram q i d w th 0 6 gr m N HCO3 f r 7 d y	N g m	61	18	4	39
Aur my 500 mg q 6 h for 5 d y	N organi m	57	57	0	0
Re-t tm t w th ure mycin 500 mg q 6 h for 5 d y f ll p t e t ur d w h bov t tm		96	92	4	0

ment In most instances, the discharge had ceased or almost ceased at the end of the third day of treatment Aureomycin is eliminated in an active, highly concentrated form in the urine even when given in small doses This is partially responsible for its high degree of effectiveness in urethral infections Gastric irritation was the only side reaction encountered from the use of aureomycin, but it was satisfactorily treated with aluminum hydroxide gel and did not necessitate discontinuance of the drug

The excellent results obtained in this series of patients treated with aureomycin were confirmed by verbal reports received from other medical installations Besides being gratifying to the physicians, the results were even more gratifying to the patients

PROSTATOVESICULITIS

It was found that the patients with prostatovesiculitis usually could be differentiated without much difficulty Twelve of the 19 patients gave no history of sexual intercourse during many preceding months The discharge from the urethra is usually gelatinous, sticky, and milky in color In contradistinction to many of the nonspecific urethritis cases, the discharge is usually profuse throughout the day Common symptoms are pain or fullness in the perineum, intermittent low back pain, burning during urination and frequent urination during the day The diagnosis is confirmed by rectal examination and palpation of the prostate In this series the prostate was always boggy, slightly nodulated, and only moderately tender After a thorough massage of the prostate and seminal vesicles, a large amount of discharge can be obtained from the urethra, frequently without having to strip the urethra. Although 6 of these patients presented gram positive cocci on smear, it is believed that the etiologic factor in these patients is a prolonged congestion of the prostate and seminal vesicles resulting in a low grade inflammation of the posterior urethra and verumontanum The patients frequently complain of nocturia, which is uncommon among those with anterior urethritis These discharges of primarily prostatic and vesicular origin are not accompanied by the abundant amount of desquamation of the epithelium as is characteristic of anterior urethritis Ten of these patients cleared completely of any discharge after 2 prostatic massages 5 days apart. Four showed marked improvement Of the 5 remaining all appeared clinically relieved of any symptoms or discharge after receiving a massage the first day and 500 mg of aureomycin every 6 hours for 3 days Continued treatment with massage, rest and abstinence from alcohol and sexual stimulation was recommended for from 3 to 4 weeks after leaving the ship It is believed that the aureomycin, although not essential, will hasten the subsidence of symptoms in prostatovesiculitis when used in conjunction with massage and the constitutional measures

BOOKS RECEIVED

A Atla of th Common t Ski D e by *H ry C. G S m n,* M A D M O on F R C P Lo d C l g Phy c for D f th Sk d form L tur to P tgradua R y l North Hosp t l C lt g D ma l g t H mp t d d N rth W t L don G ral H p t l E p d d V p d t D mat l g l S t R y l S y of M d C p d g M mb f th Soc t F d D mat l g t Syph l l g M da ll d ll ur d l A s ta P bl q R p bl q Fra ç M d l R f for l d ctual D rmat t M n try f F Med l R f f l d tr l D mat t M t y f N t on l l ura C l ph t g phy g lly dtr d by h l t *Arn ld M t* B A M B B C C tab 4 h d t 371 p g ll t t d w th 147 pl prod c d by d r t lor ph t graphy f m th l g bj t Th W lli m & W lk C B l m Md p bl h 1953 P c $13 50

T d of Op Ab t th P bl c H lth 1901 1951 by *J M M k t h* M D Ll D. F R C P B t n Law P f o f P bl H l h s th U ty f London U ty f L d H th Clark Le tur 1951 d l d t th Lond S h l f Hyg d Tr p cal M d n 202 pag Ge ffrey C mb l g Oxford U y P N w Y k N Y p bl h 1953

A ual R w f M d c by *W d C. C tt g* Ed St ford U ty S hool f M d d *H ry W Newma* A sociat Ed t St ford U y S h l f M d V l me 4 452 pag A ual R w l Sta ford Cal f p bl h c 1953 P $6

D ur Th rapy Th Pha m l gy f D ur t Ag t d th Clin l M nag m t f th Ed matou P t by *Alf d V gl* M D A t t P f s f Cl l M d N w Y k U ty C ll ge f M d A oc V g Phy c Th d M d l D B ll Hosp tal A oc t V t g Phy n M d l D on M t pol ta H p tal N w York N Y F me ly As ociat V t g Phy ic P l cl c H p tal V na d Cl l A ta G y H sp l M d l S h l Lond 248 pag ll trat d Th W ll m & W lk s C B lt m Md p bl h 1953 P c $5

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THE NITROGLYCERIN-FLICKER FUSION TEST

A Study of 300 Patients

RICHARD P JOHNSON *Colonel, MC, USA (1)*

THE nitroglycerin flicker fusion test was used in a series of 300 patients during 1950-1951 at the cardiac clinic, Brooke Army Hospital, to evaluate coronary artery circulation It seems pertinent at this time to analyze the results and to determine its clinical usefulness

PROCEDURE

The Krasno and Ivy *(2)* technic was used with the patient comfortably seated 1 6 meters from a photometer light (fig 1) He must have fasted for 4 hours, refrained from smoking for 6 hours, had no alcohol or vasodilator drug during the previous 24 hours, and have rested for at least 10 minutes before the test The patient is then given several trial runs The light in the photometer is turned on at 3 000 flashes per minute, because at this speed it is seen as a steady, bright light The speed of flicker is then gradually decreased until the patient sees a steady flicker At that moment he presses a switch he holds in his hand which illuminates a light visible to both the operator and the patient The procedure is repeated until 3 readings of about the same value have been obtained This is the patient's flicker fusion threshold (FFT) A 0 4 mg tablet of nitroglycerin is placed under his tongue, after which the test is repeated at 2, 4, and 6 minutes

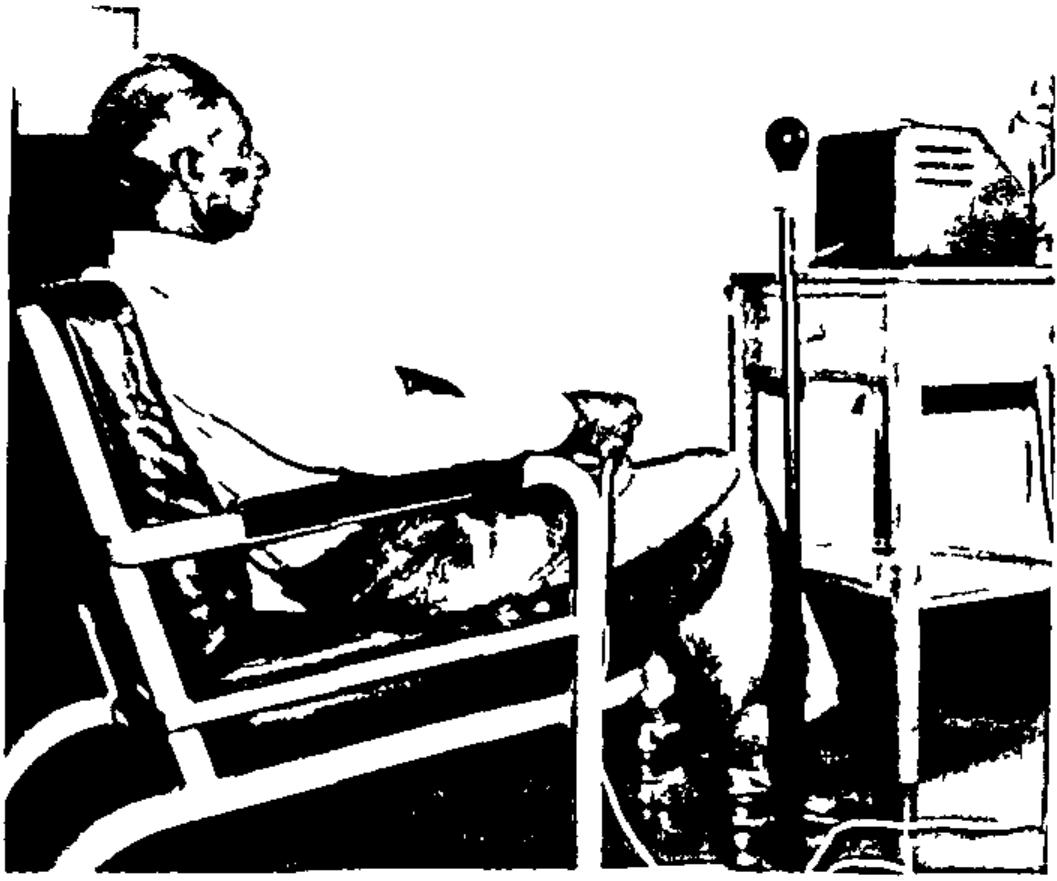
A normal response to nitroglycerin is a decrease in the FFT value The patient does not see the flicker until the flashes are fewer per minute than before the nitroglycerin was given This is believed to be due to a relative anoxia of the retina resulting from passive hyperemia produced by dilating the retinal arterioles with nitroglycerin *(2)* In an abnormal response (an improved FFT), the patient sees flickering when the flashes per minute are more rapid than before the nitroglycerin is given The explanation of improved FFT is an active hyperemia of the retina

(1) Now tat ed t\ ll y Forge Army H p tal Phoenixv ll P

(2) Kra L. R nd Ivy A C. R pons f fli ker fus n thr sh ld t nitroglyc n nd t pote tial val e in diagnos pr gnos nd th rapy of s bclinical nd linical card ov lar dis Circulati 1 1267 1276 June 1950

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as the arterioles are released from spasm by the nitroglycerin (2) The amount of change in FFT necessary to define a normal or an abnormal response to nitroglycerin is a decrease or increase respectively, of at least 60 flashes per minute When the response is less than plus or minus 60, the test is immediately repeated after a second tablet of nitroglycerin (0 4 mg) is given the patient If the change is still less than plus 60 it is interpreted as a normal response in this study All patients are given at least 3 tests on 3 different days and the results are averaged



Figur 1 Thi how the p tient s po iti i lation t the fli k photometer H i holdi g the sign l wit h i h ight hand

Examples of two typical responses to nitroglycerin are seen in table 1 The first example is a normal response and the patient has an impaired FFT after nitroglycerin The second example is an abnormal response and the patient has an improved FFT after nitroglycerin

NORMAL GROUP OF PATIENTS

In a study of 100 patients with no evidence of cardiovascular disease, 59 gave a normal and 41 an abnormal response

It was surprising that 41 percent of a group of presumably normal persons without cardiovascular disease showed an ab-

normal response Further analysis of this group is shown in table 2 The response of psychoneurotic patients with the diagnoses of anxiety reaction (22), chronic alcoholism (1), hyperventilation syndrome (2), and neurocirculatory asthenia (6) is no different from those who are considered completely normal The age distribution of this group of 100 patients was from 18 to 75 years There were 94 men and 6 women

TABLE 1 *Typical responses to nitroglycerin in patients given the nitroglycerin flicker fusion test*

Patient	Basic FFT	After nitroglycerin			Change
		minutes	4 minutes	6 minutes	
1	400	400	80	0	−170
	2400	2550	500	440	140

HYPERTENSIVE GROUP OF PATIENTS

Ninety patients with hypertensive vascular disease were tested None had a history or electrocardiographic evidence of angina pectoris or myocardial infarction The results showed a normal response in 51 patients and an abnormal response in 39

TABLE 2 *Summary of the response to the nitroglycerin flicker fusion test in 100 persons without cardiovascular disease*

Diagnosis	Number of patients	Normal response		Abnormal responses	
		Number of patients	Percent	Number of patients	Percent
No disease	69	40	5	9	4
Psychoneurosis	31	19	61	1	39
Total	100	59	59	41	41

The results were almost identical with the normal group of patients Further analysis is shown in table 3 Those with a diastolic blood pressure under 110 mm Hg had a response about the same as the normal group There was a greater percent (56 compared with 36 percent) of patients with an abnormal response among those with a higher diastolic blood pressure than among those with a diastolic pressure of less than 110 mm of Hg The fact that over 75 percent of the women and only about 50 percent

of the men had a normal response is difficult to interpret The blood pressure levels of the men and women were similar The presence of an enlarged heart was not significant in the response in this group Those with myocardial insufficiency had a higher percentage of normal response but the group was too small to be significant The patients were also classified by funduscopic examination according to the Wagener-Keith *(3)* grouping Because 60 percent of those with normal fundi and 47 percent of those with abnormal fundi had a normal response there seems to be correlation As in the normal group 40 percent of those with normal fundi still had an abnormal response

TABLE 3 *S mm ry f th p e t th t gly fl k fus t t s 90 p t t w th hyp t v l d g d d g t d c d ova l f d g*

	N mb f pa	N mal p		Ab mal f p	
		N mb f p ts	P t	N mbe f p t ts	P t
M	77	41	53	36	47
W m	13	10	77	3	23
Lev l f dia l bl od pr ur					
L tha 110 mm Hg	58	37	64	21	36
110 t 130 mm Hg	23	10	43	13	57
Ov t 130 mm Hg	*9*	*4*	*44*	*5*	*56*
N mal iz h rt	64	35	55	29	45
E la g d heart	26	16	62	10	38
Myoc rdial i uffi y	6	4	67	2	33
F nd ormal	37	22	60	15	40
g d I	21	10	48	11	52
grad II	29	13	45	16	55
g d III	3	2	67	1	33
grad IV	0				

W g K h la f cat

CORONARY INSUFFICIENCY GROUP OF PATIENTS

The greatest interest was focused on the response of a group of 91 patients with angina pectoris or myocardial infarction The response was normal in 24 patients (26 percent) and abnormal in 67 patients (74 percent) The percentage of abnormal response to the test in this group was significantly higher than in the

(3) W g ne H. P d K h N M D ffus lar dis w h hyp ns oc ad as ocia ed t mal l ns Med 18 317 430 Sept 1939

normal and hypertensive groups of patients, but still 26 percent of those with known coronary insufficiency had a normal response Further analysis of this group is shown in table 4

In the group of 38 patients with angina pectoris, 13 (34 per cent) had a normal response In this group, those patients with enlarged hearts had a smaller percent of normal response Hypertension has no effect on the response to this test, neither does the presence of myocardial insufficiency nor an abnormal electrocardiogram This group of 38 patients had classic symptoms Some patients who may have had angina pectoris but without

TABLE 4 *Summary of the response to the nitroglycerin flicker fusion test in 91 patients with coronary insufficiency arranged according to type of coronary insufficiency the presence of systemic hypertension, myocardial insufficiency and abnormal electrocardiogram*

	Number of patients	Normal response		Abnormal response	
		Number of patients	Percent	Number of patients	Percent
Angina pectoris	38	13	34	25	66
Enlarged heart	9	2	22	7	78
Hypertension	16	6	37	10	63
Myocardial insufficiency	3	1	33	2	67
Abnormal electrocardiogram	8	10	34	18	64
Myocardial infarction	53	11	21	42	79
Enlarged heart	13	2	15	11	85
Hypertension	19	2	11	17	89
Myocardial insufficiency	8	0	0	8	100
Abnormal electrocardiogram	53	11	21	42	79
Recent infarction	14	3	21	11	79
Healed infarction	39	8	21	31	79

the classical clinical syndrome were not included This may explain the high percent of abnormal electrocardiograms (74 per cent) in this group

Fifty three patients had a recent or healed myocardial infarction The highest percentage (79 percent) of abnormal response occurred in this group and was about the same whether the patients had recent (within 1 year) or healed infarctions The presence of an enlarged heart, hypertension, or myocardial insufficiency progressively increased the percentage of patients with an abnormal response

MISCELLANEOUS GROUP

A final group of 19 patients with other types of heart disease were tested All except 2 with rheumatic heart disease had a normal response to nitroglycerin The group was too small from which to draw any conclusions

PREVIOUS STUDIES

Landis *(4)* emphasized that much remains to be learned about this test and that many factors alter the results Flicker fusion testing has been used in studies on visual acuity fatigue, anoxia, anxiety and brain injury as well as cardiovascular pathology Many theories interpreting the mechanism of it exist but not one is completely satisfactory Many factors such as age of the patient body temperature, use of one or both eyes as well as mechanical factors affect the test Landis listed factors such as color blindness anatomic structure of the eye, genetic constitution of the individual, color or intensity and wave form of the light flash which may affect the test but still need further study

Enzer et al *(5)*, in studying 22 patients with heart disease used the flicker fusion technic without nitroglycerin and found an abnormal response in 20 They attributed this to anoxia of the visual pathways in the brain and fatigue resulting from circulatory insufficiency

Krasno and Ivy postulated that if vasospasm could be demonstrated in the retinal arterioles, a similar condition could be assumed to be present in the coronary arterioles It was on this basis that they devised the test of the response of the FFT to nitroglycerin In 268 patients without cardiovascular disease they obtained a normal response in 206 (77 percent) and an abnormal response in the remaining 62 (23 percent) They believed these abnormal responses were due to anemia diabetes, preeclampsia or poor hygiene In 216 patients with various cardiovascular diseases (all except 20, with hypertension or coronary heart disease) they obtained an abnormal response in 100 percent Fox and Wright *(6)* and Russek et al *(7)* repeated these studies but found the test unreliable because 13 and 21 percent respectively, of the normal persons tested had an abnormal re

(4) Landis C. Some bi g bou fl k fus n. Sc Mon hly 73 308-314 Nov 1951

(5) Enz N S mons E d Bla k n, S S F g f pa w h cur- La ory nsuff y t ga d by means f fusi f q cy f fl k r Ann Int Med 16. 701 707 Ap 1942

(6) Fox E L nd W gh I S Th n tr glyc n-fl ke t Circ la ion 4 350-358 Sept 1951

(7) Rus k H. I And W H nd Doer A A S g f ca c f be nitro- gly n-fl ke fus p ns in ormal bj ts nd pa i wi h ard ova cula dis Cir la on 4 359-365 Sept 1951

sponse The former group obtained a normal response in 60 per cent of 63 patients with cardiovascular disease and the latter group obtained a normal response in 68 percent of 76 patients Golden and Cordasco *(8)* obtained an abnormal response in 3 of 51 normal patients (6 percent) They obtained only 2 normal responses in 100 patients with hypertensive or atherosclerotic heart disease Hopkins *(9)* obtained 38 percent abnormal tests in a group of 81 normal subjects Keys and Simonson *(10)* tested over 300 men and concluded that the test was of no value in the diagnosis of coronary artery disease

Lueth and Hanks *(11)* reported untoward reactions to nitroglycerin in 18 percent of 50 patients with hypertensive heart disease The reactions ranged from nausea and vomiting to syncope or collapse Six reactions (2 percent), characterized by a brief period of weakness, occurred in the group reported here

SUMMARY AND CONCLUSIONS

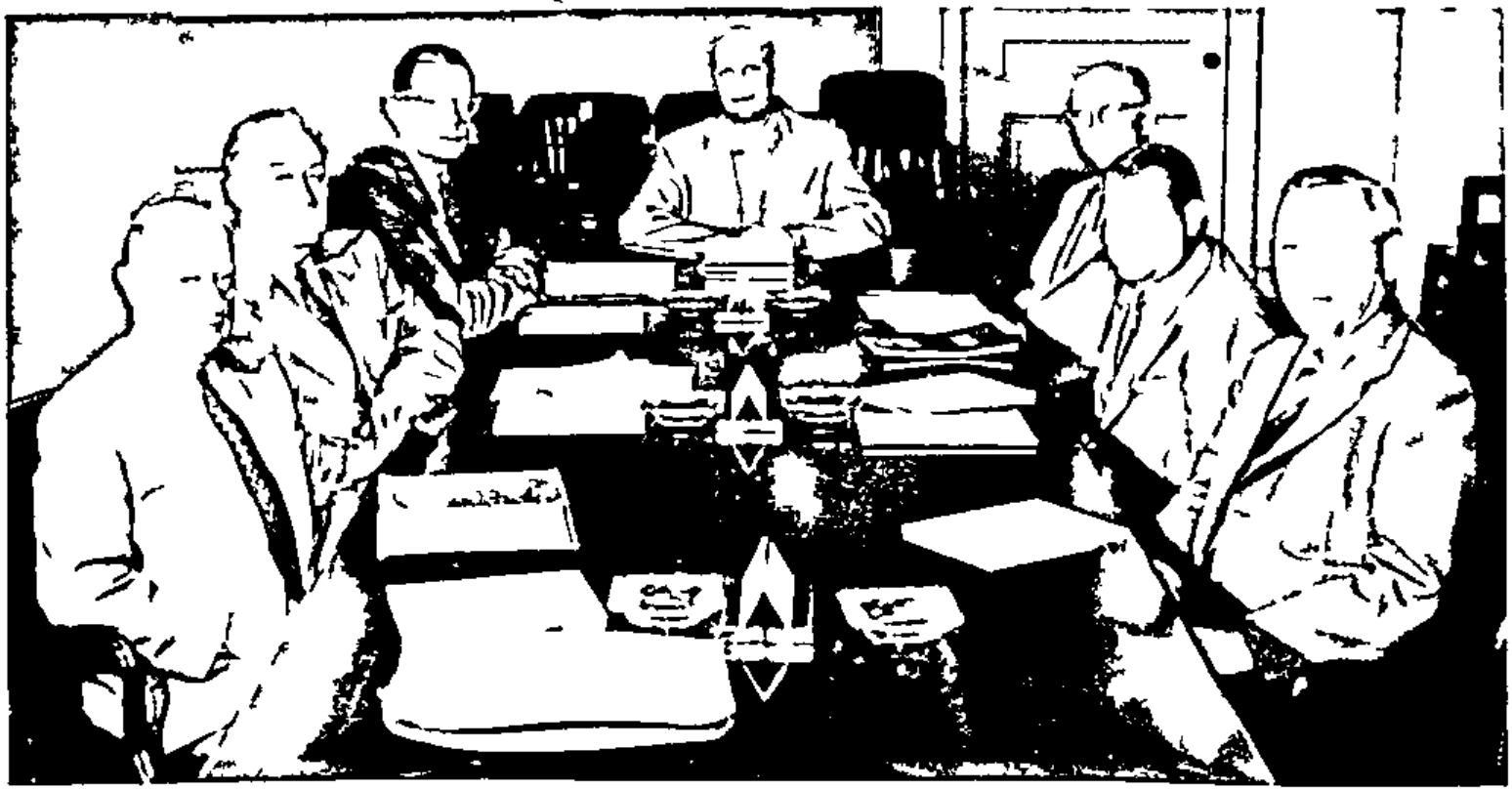
We have utilized the nitroglycerin flicker fusion test as described by Krasno and Ivy, in a study of 300 patients to determine its value in the diagnosis of coronary insufficiency In 100 persons without organic cardiovascular disease, an abnormal response was obtained in 41 percent In 90 patients with hypertensive vascular disease, but without clinical or electrocardiographic evidence of coronary insufficiency, 43 per cent had an abnormal response In these 2 groups, the presence or absence of hypertensive vascular disease in otherwise normal persons did not affect the response to the test In 91 patients with coronary insufficiency (angina pectoris or myocardial infarction), an abnormal response occurred in 74 percent which was almost double the incidence of abnormal response in the other 2 groups This test cannot be relied on to separate those with from those without coronary artery disease because 26 per cent of the former had normal response and 41 percent of the latter had abnormal response The overlapping response to this test is too great to permit its use in the diagnosis of coronary insufficiency

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(9) Hopkins R. W., Studies in Arctic with flicker-fusion nitroglycerin test, new method of evaluating cardiovascular states New England J Med 246 401 407 Mar 13 19

(10) Keys A., and Simonson, E., Flicker fusion frequency and its response to nitroglycerin in normal subjects and in patients with cardiovascular disease Circulation 215-224 Feb 1952

(11) Lueth H. C. and Hanks T. G., Unusual reactions of patients with hypertensive [illegible] to glyceryl trinitrate Arch. Int. Med. 62 97 10 July 1938



ASSISTANT SECRETARY OF DEFENSE AND CIVILIAN ADVISORS

Dr M l A Ca be g wh w tly pp t d A t S c t y f D fe (H lth d M d l) th g zat of th D pa tm t f D f t h w w th th m mb s f th C l H l h d M d l Ad ory C e l L ft gh W ll m S M ddl ton M D D U ty f W Sch l f M d c A h y J J R k M D P d t H p l C l f Gre N w Y k Dw ght L Wilbur M D Cl cal P f or f M d St ford U ty School f M d D Ca b g Alf d R Sh d J M D M d l D tor th N m F d tion Alf d I D Pon In t t l d S R di M D Joh Rh B on P f f S g ry U ty f P yl School f M d d J m P H ll D D S

THE TREATMENT OF TRICHOPHYTON PURPUREUM INFECTIONS

ROBERT E LYONS *Colonel USAF (MC) (1)*
CARL W WELLER *Lieutenant Colonel MC USA (2)*
JACK W McNAMARA *Captain MSC USA (2)*
JACK L DERZAVIS *M D (3)*

SINCE Peck et al *(4)* first called attention to the fungicidal properties of thermal sweat many reports *(5-14)* on the clinical efficacy of fatty acids for the treatment of fungus infections, have appeared in the literature Most of these reports concern the results of treatment of superficial fungus infections due to *Trichophyton mentagrophytes* and *Epidermophyton*

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(2) Walter Reed Army Hospital Washington, D C
(3) Consultant, Walter Reed Army Hospital Washington D C

(4) Peck, S M Rosenfeld, I L Geiger W and Bierman, W Role of sweat in fungicidal with special reference to use of constituents of sweat in therapy of fungus infections Arch. Dermat & Syph. 39 1 6-148, Jan. 1939

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(14) Sulzberger M B and Kass of A Comparative evaluation of preparations for propionyl xis and treatment of fungus infections of feet. U S. Navy M Bull 46 822 833 Jun 1946.

floccosum In 1938 Lewis et al *(15)* published their classic paper on the cutaneous manifestations of *Trichophyton purpureum* (Bang) Their only reference to the treatment of this condition was that infections caused by this fungus were difficult to cure and chief reliance must be placed on strong measures Since then many dermatologists *(10 16-19)* have found infections due to *T purpureum* extremely resistant and chronic requiring months or years to influence favorably

It has been our experience that the response of infections with *T purpureum* to treatment depends on the body site involved Those of the torso and groin can be favorably influenced by relatively simple measures but chronic infections of the palms and soles are extremely resistant and respond only after long periods of treatment if at all

In the summer of 1950 one of us (REL) conducted a project at the Walter Reed Army Hospital in an attempt to evaluate standard and experimental preparations in the treatment of infections with *T purpureum* Undecylenic acid asterol dihydrochloride and G 4 or 2 2 methylenebis (4 chlorophenol) were among the agents clinically evaluated for a 3 month period At the end of that time it was found that of 30 patients with such infections of the palms and soles none were clinically cured and 27 still had positive cultures The conclusions from this project were that the compounds used were either not fungicidal or did not penetrate the keratin in sufficient concentration to act on the embedded fungus The use of polyethylene glycol 1500 as the ointment base possibly prevented absorption and invalidated the first conclusion *(20)* Polano *(21)* reported no appreciable skin reactions when known irritants are applied to the skin in this base and this has been substantiated by Livingood *(22)* These unsatisfactory results prompted 2 of us (REL and JWMcN) to search for a more useful agent. Peck et al *(4)* had reported that fatty acids must be in proper concentration to exert a fungicidal

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(15) L w G M llo g m y P M a d H pp M E Cut ma f t f T hophyt purpur m (B g) Ar h De mat & Syph. 37 823-839 M y 1938.

(16) Ep E L w G M L man, A B P ll bury D M Sch k A C Sh Tni B Sm th D C. Sw t J H d W d L M Sympo i m p t l m nag m f ma gw m f hand nd f J I De mat 3 523-562 D 1940

(17) Ep E De ma phyt f hand d g d p g i Ar h. D mat. & Syph 45 1113-1124 J 1942

(18) Ca M R F g nf f f J A M A 124 751 756. M 18 1944.

(19) S l b g M B I m l g ha g bro ght bo t by f g d f g prod- An N w Y k A d. S 50 767 772 D 26 1949

(20) Sh ll y W B d M l F M F c l g p ra f h mi hr gh mal tact huma k J I t D ma 13 61 71 A g 1949

(21) P l M. K. Sk Ther p P p d P para El P Inc H t T 1952

(22) L good, C. S. P nal mm a.

effect. Other investigators *(7 10 12 13)* showed that a combination of fatty acids and their salts were more effective than when these acids were used singly. Working on these principles we developed a liquid preparation that was actively fungicidal in vitro did not irritate or sensitize the skin and was cosmetically acceptable on the palm of the hand. The final formula contained

	Gm. or cc.
Sodium propionate	2
Sodium caprylate	2
Propionic acid	3
Undecylenic acid	5
Salicylic acid	5
Copper undecylenate	5
Dioctyl sodium sulfosuccinate	1
Water, distilled	20
Isopropyl alcohol (91 percent) q. s. ad	100

IN VITRO STUDIES

Studies were performed in vitro with this mixture using a modification *(23)* of the technics of Burlingame and Reddish *(24)* and Golden and Oster *(25)*. These tests showed that this compound was more actively fungicidal in vitro than a variety of other commercial and prescription preparations including (1) decaenex (2) sopronol (3) decupryl (4) 5 percent asterol dihydrochloride (5) a solution of 6 percent salicylic acid and 12 percent benzoic acid in 70 percent isopropyl alcohol and (6) octofen and others. Of all the fungicidal solutions tested only quatrasal approached the in vitro activity of this compound.

CLINICAL RESULTS

Seventeen patients infected with *T. purpureum* were treated with this preparation. The average duration of their disease was 7.6 years and all had had previous treatment with strong measures. Fifteen had positive cultures prior to the onset of treatment. Of the 17 patients treated 15 became clinically clear in an average of 25.7 days. The remaining 2 showed rapid and complete disappearance of lesions except for the persistence of slight scaling. These results are considered remarkably good in that 14 of the patients treated had involvement of the palms and/or soles.

(23) Lyons, R. E., and Langood, C. S.: Laboratory technic for evaluation of fungicidal ointments. To be published in Arch. Dermat. & Syph.

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(25) Golden, M. J., and Oster, N. A.: Studies on alcohol soluble fungistatic and fungicidal compounds; evaluation of fungicidal laboratory test methods. J. Am. Pharm. A. (Scient. Ed.) 36: 359-362, Nov. 1947.

TABLE 1 *Result f 17 p ti t t at d f f ti with* T p p r m

Ca	Ag (y)	S	Dur ti (y)	S i l d	Cl ni lly l t (day)	R m k
1	41	M	10	P lm or so	17	R p d r po t ted t lea i 3 day
2	29	F	2	Sol or	42	75 p mp m t f 3 w k
3	26	F	6/12	T o	17	P i ul ur n th d y f treat m p tu lea
4	34	M	10	P lm l	14	S l g ecur d wh m d wa pp d g t ul ur
5	31	M	3	P lm t	66	Sl w po gat ul ur f 3 6 d 9 w k
6	39	F	6/12	P lm	21	Scal g ecur d wh m d cat w pped g ul ur
7	29	F	9	P lm l	21	S l g ec d wh m d cat w t pped g ul ur
8	21	M	1	Sol gr	78	Cul ur g t e f 42 day l w po
9	33	F	10	P lm sol or so	21	Scal g ur ed f m d wa pp d ga ul ur f 6 w k
10	23	M	20	Sol	14	Scal g us ed l m d w pp d
11	27	M	4	Sol		Scal g t ll p ent f 38 day ga cul ur

TABLE I *Results in 17 patients treated for infection with T purpureum—Continued*

Case	Age (years)	Sex	Duration (years)	Site involved	Clinically clear (days)	Remarks
12	20	M	1½	Palms soles	24	Culture remained positive although patient was clinically clear
13	40	M	8	Groin trunk	13	Cultures negative 3 weeks after treatment was stopped
14	47	M	30	Palms soles		Scaling still present after 49 days treatment cultures remained negative 5 months after cessation of treatment
15	24	M	7	Groin	7	Skin clinically clear 1 month after treatment was stopped.
16	24	M	6	Palms soles	14	Cultures negative after 3 weeks
17	23	M	6	Soles	16	Cultures negative on 16th day of treatment slight scaling recurred 2 months after treatment was stopped

Onychomycosis not considered nor included

All patients treated for over 24 days developed negative cultures The 2 patients who showed slight scaling after treatment for 38 and 49 days respectively had negative cultures In the latter case the cultures were still negative 5 months after cessation of treatment.

Four of the patients with palm and sole involvement remained clinically cured as long as they used the medication daily or twice weekly Cessation of use resulted in the recurrence of slight scaling although cultures remained negative The results of treatment are summarized in table 1 No signs of irritation or sensitization appeared in patients using this compound A slight burning sensation was at times noted by patients when applying this liquid to the groin and scrotum This lasted an average of 5 minutes but no signs of erythema were noted at any time The burning sensation was mild compared with that produced by other agents used by these patients

DISCUSSION

Preliminary results have shown that chronic infections of the palms and soles with *T purpureum* respond readily and rapidly to the application of this hydroalcoholic mixture twice daily The average patient becomes clinically clear in about 26 days A few patients develop scales after the cessation of treatment but these scales disappear on resumption of the daily or twice weekly use of the medication

We have not evaluated this preparation in the treatment of the more inflammatory or eczematous eruptions due to superficial fungus infections On theoretical grounds we would not consider the preparation particularly promising in these conditions nor in tinea capitis One of us (JLD) used the preparation on 12 patients with tinea capitis due to *Microsporum audouini* for 1 month with no appreciable change in the condition

CONCLUSION

These preliminary results indicate that the compound used is as effective (if not more so) against chronic infections with *T purpureum* as the commercial preparations now available

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BOOK RECEIVED

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SIMPLE METHOD OF STEREOSCOPY

HARRY L. BERMAN *Colonel MC, USA (1)*

JOHN E. EDWARDS *Major MC, USA (2)*

THREE simple methods of making stereoscopic studies of roentgenograms have been employed by us in Korea. Easily obtainable materials were used. These techniques are especially applicable in field hospitals where conventional stereoscopes are not available because of their bulk and the limited transportation facilities.

Stereoscopic examination is often necessary in mobile army surgical and evacuation hospitals. Aside from its value in routine roentgenographic work, the stereoscopic examination is especially useful in localizing foreign bodies and bone fragments in the skull and orbits. If multiple metallic fragments

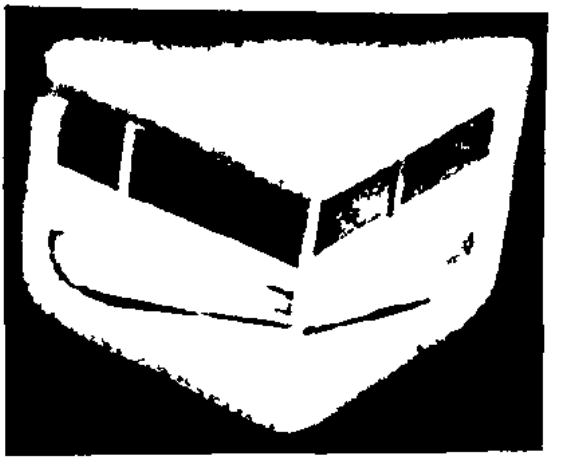


Figure 1. The 90° prism.

are present, as, for example, in or about the eyes, the stereoscopic examination is the only one which permits accurate localization. Small bone fragments within the skull are frequently discovered only by stereoscopic examination. When the patient's condition is such that roentgenograms can be made in only one projection, stereoscopic films facilitate the examination. Stereoscopic roentgenograms also delineate anatomic structures more clearly in parts where there is extensive superimposition of shadows, as in the skull.

The following methods of performing stereoscopy were used: (1) forced convergence, (2) the 90° prism, and (3) small angled

(1) Walter Reed Army Hospital, Washington, D. C.
(2) Madigan Army Hospital, Tacoma, Wash.



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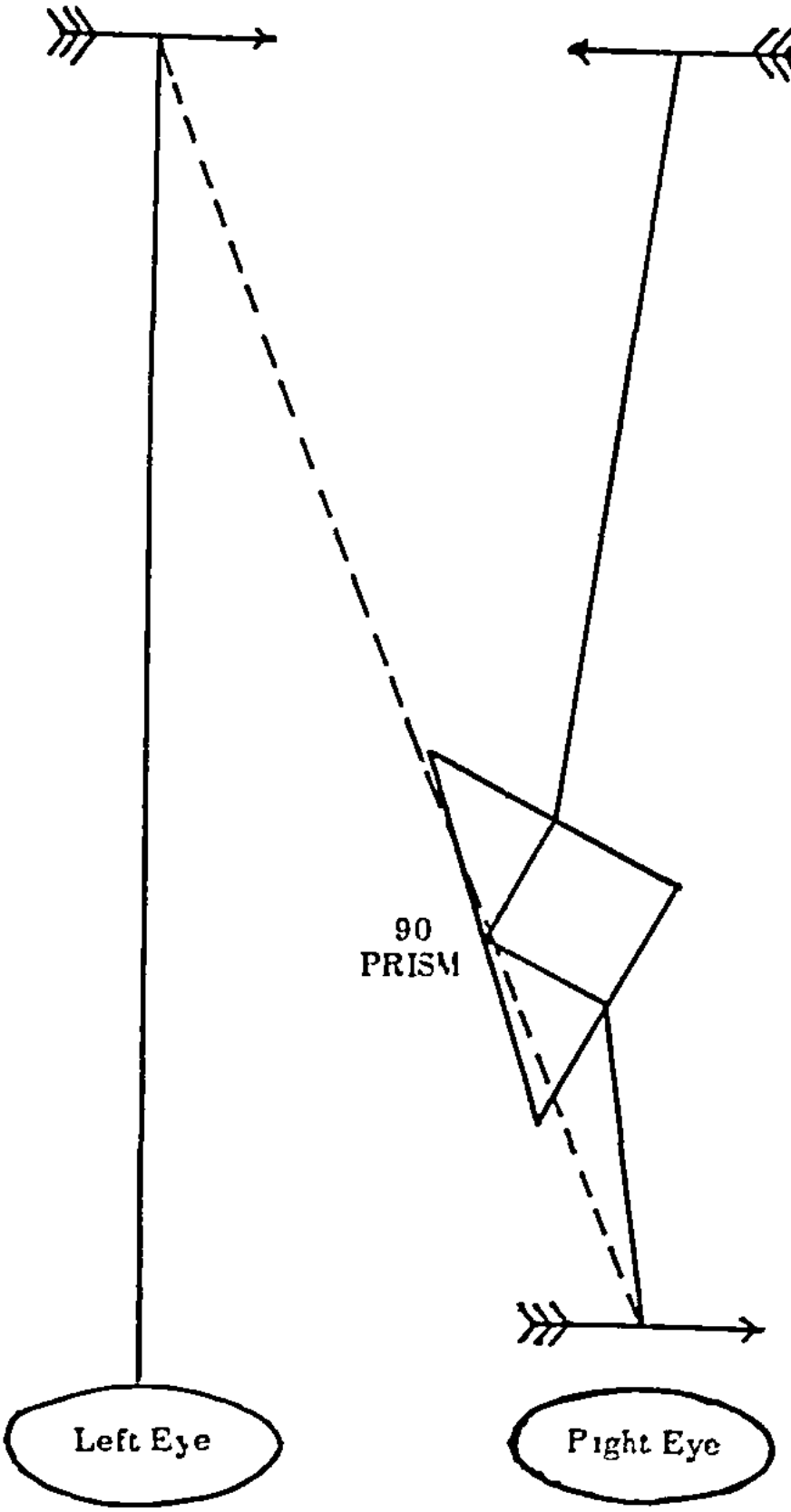


Figure 3. The principle of the 90° prism.

prisms Other simple methods of stereoscopy may be used with excellent results The set of small mirrors in a light frame described by Amory and Smith (3) is a simple instrument which can be used easily and effectively but it is still in the test stage and, as indicated in the opening paragraph this article is restricted to those methods for which materials were easily and readily available in Korea under field conditions

Stereoscopic roentgenograms for the cited methods are made in the conventional manner It is preferable to use a side-to-side shift of the x ray tube in making the roentgenograms because this permits them to be studied in the customary upright position whereas an up and-down shift requires that the films be turned sideways

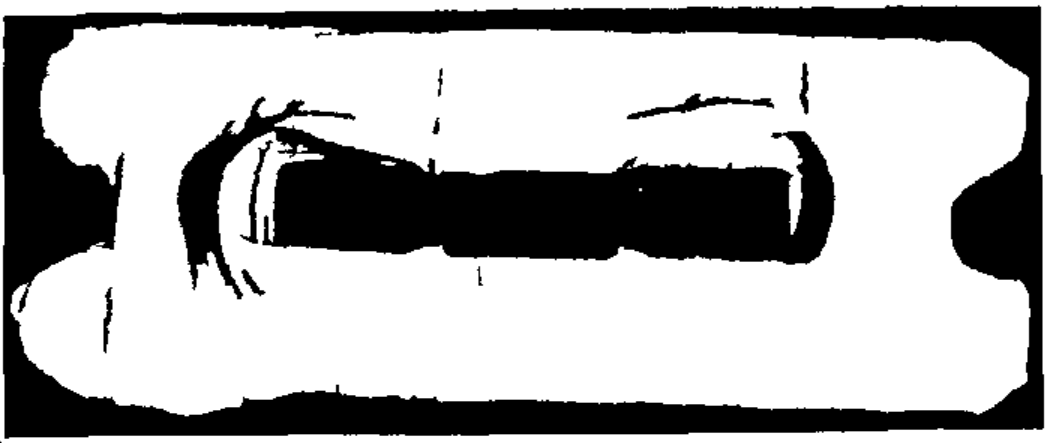


Fig re 4 The small-a gled prism o a fram of to gu depre s.

Forced convergence This method requires practice It is fatiguing to the eyes has not been widely used and therefore has a limited degree of application

The 90 prism This instrument (fig 1) was obtained from the periscope of a salvaged tank The original prism of the periscope which is about 6 inches long, was cut into 4 segments each of which measured 5 2 by 3 cm at the base 3 7 cm along the side, and had an angle of 90 at the apex The base of the prism is silvered An acrylic jacket was applied to protect the edges from chipping The arrangement of the roentgenograms on the view boxes for use with this prism is shown in figure 2 The two view boxes are placed side by side and the roentgenograms positioned next to each other as illustrated The film on the right is the mirror image of the one on the left. Roentgenograms of an object in the frontal projection may be changed from one view box to the other with the resultant reversal of the stereoscopic effect, but in the lateral view there is only one true

(3) Am ry H. I d Sm th, S. W M litary f ld -ray eq ipm nt Radi l gy 59 879-892 D 1952.

Figure 5 Arrange a pair of small plane prisms

tridimensional effect and it is extremely important that the films be properly placed on the view boxes In comparing the distances between the anterior margin of the skull and the adjacent edge of the roentgenogram on the right and left view boxes, respectively the direction of the tube shift and the resulting proper position for each roentgenogram can be noted in figure 2

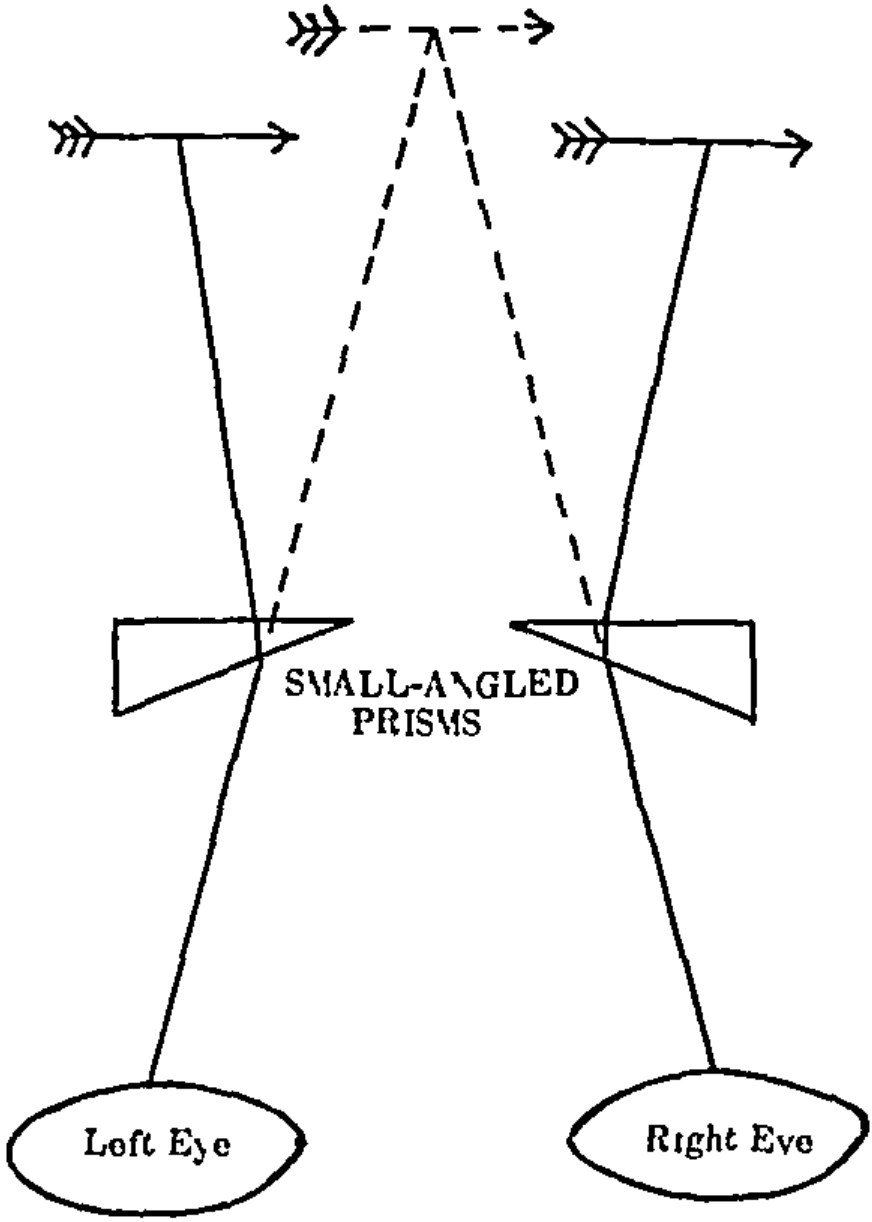


Figure 6. The principle of the small-angled prisms.

In studying the roentgenograms the prism is placed in front of one eye with the base towards the nose and the apex pointing laterally If the prism is placed in front of the right eye the left eye looks straight ahead to the film on the left view box By rotating the prism gently in all planes the image of the roentgenogram on the right view box is superimposed over that on

the left, thus producing a stereoscopic effect. The optimum distance from the eyes to the view boxes is about 18 inches. A slight forward and backward motion of the head should be used to determine the optimal distance for the best stereoscopic effect. The resultant stereoscopic image is the same in size as that on the roentgenograms.

The optical principles involved in this method of stereoscopy are shown in figure 3.

The small angled prisms. Two prisms of from 15 to 20 diopters each were mounted on tongue depressors with adhesive tape, with the base of the prisms outward and their centers about 2.5 inches apart, corresponding to the interpupillary distance (fig. 4). The roentgenograms are placed on adjacent view boxes, as shown in figure 5. Due regard is given to the tube shift and corresponding positioning of the films with respect to the right and left view boxes. While standing 3 or 4 feet from the view boxes, the prisms are held in front of the eyes. The stereoscopic effect is obtained by slight clockwise or counterclockwise rotation of the prisms and simultaneously by moving slightly forward or backward. The optical principles involved in this method are shown in figure 6.

In comparing the use of the 90° prism with that of the small angled prisms, one has little advantage over the other and both are easily used. The 90° prism gives a larger image and thereby permits a clearer view of details. On the other hand, the small angled prisms, although giving a smaller image, permit larger structures to be seen stereoscopically to better advantage than does the 90° prism. With a little practice the examiner acquires proficiency with either method.

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Cond ct on A th by *G org P P tk* M D F A C S F I C A d d by *J m L. S thwo th* M D F A C S F m ly Se or Surg on U S P H S Forme ly C -dr tor C d c l r Cl c P bl H l h Serv H p l B ltm Md Att d g Surg E t T T be l ll p t l d E t T B pt t H p tal k ox ll T *R b t A ll g* M D F A C S F I C A F I C S F (F l y f A t) R C S (E gla d) F t Dir t A th Wom D ı (Ph l d lphıa Ly g l H p t l) f P yl H p t l Fur t P f or of A th ı U ty f T School f Med cine Form rly Se or Surg on U S P H S Form ly A oc t P f or of Ob t t J hn H pk U r ty P f or of A th ı W t R rv U ty Cl la d Oh d *W f d M P tk* M A (O on) B k B Ch (Oxon) M R C S (E g) L R C P (L g) M D A Surg ry t th lat Georg P P tk 2d d t 1 005 p g ıll ra on J B L pp ott C Ph lad lph P publ h r P ic $22 50

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ANALYSIS OF SWIMMING POOL TURNOVER STANDARD

ROBERT G McCALL *Lieutenant Colonel, MSC USA (1)*

THE water of a swimming pool must be replaced by an equal volume of either treated water or clean, new water once in every 8 hours *(2, 3)* Some public health agencies require such a turnover every 6 hours For a better understanding why such a requirement has been so uniformly adopted a mathematical proof of its soundness is presented When this 8 hour turnover requirement was seriously questioned by a post commander I successfully used this proof to aid in having an unsatisfactory swimming pond replaced by a modern swimming pool Preventive medicine personnel and surgeons may find a similar or related use for this material

PURIFICATION BY CONSECUTIVE DILUTION IN ONE TURNOVER

In a recirculating or flowing through pool, in which dirty water is continually being withdrawn and replaced by filtered or fresh water, clarification of the pool water is accomplished by consecutive dilution The first portion of the water withdrawn from the pool will be all dirty water, but due to constant admixture of entering clean water with the dirty water remaining, each succeeding portion of water withdrawn will consist of a decreasing proportion of dirty water mixed with an increasing proportion of clean water

The law of purification by consecutive dilution, as applied to recirculation and flowing through pools, can be developed as follows

1 A turnover is defined as a quantity of clean water added to a pool in an amount equal to the volume of water in the pool

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(1) Army Environmental Health Laboratory Office of The Surgeon General, Army Chemical Center Md

(2) TB MED 163 Sanitary Control of Army Swimming Pools and Swimming Areas May 1945

(3) Joint Committee on Bathing Places American Public Health Association and Conference of State Sanitary Engineers Recommended Practice for Design Equipment and Operation of Swimming Pools and Other Public Bathing Places American Public Health Association 1949

2 It can be calculated and has been supported by experimentation *(3)* that at the end of one complete turnover the turbidity removal will be 63 percent. For example assume a pool which has a turnover of x hours or 60x minutes

a. At the end of 1 minute $\left[\frac{60x-1}{60x}\right]$ of the original turbidity remains

b At the end of 2 minutes $\left[\frac{60x-1}{60x}\right]^2$ of the original turbidity remains

c At the end of 3 minutes $\left[\frac{60x-1}{60x}\right]^3$ of the original turbidity remains

d. At the end of 60x minutes $\left[\frac{60x-1}{60x}\right]^{60}$ of the original turbidity remains

3 Then for a pool having a 12 hour (720 minute) turnover the turbidity remaining at the end of one turnover is $\left[\frac{719}{720}\right]^{720}$ of the original turbidity This value is obtained as follows

$\log \left[\frac{719}{720}\right]^{720}$ 720 (log 719 − log 720)

720 (2 856729 − 2 857332)

720 (0 000603)

0 43416

1•0 56584

then $\left[\frac{719}{720}\right]^{720}$ 0 368

36 8%

4 In a like manner it can be calculated that 36 78 percent of the original turbidity remains at the end of an 8 hour turnover and 36 86 percent at the end of a 24 hour turnover Therefore one can proceed with the sound value of 100 percent minus 37 percent or 63 percent as the amount of turbidity removed by one turnover

PURIFICATION BY SUCCESSIVE TURNOVERS

With a like percentage of the remaining turbidity removed by succeeding turnovers purification will proceed as follows

1 After 2 turnovers the percent of the original turbidity removed 63% + 63% (100% − 63%)

63% + 23 31%

= 86 31%

2 After 3 turnovers the percent of the original turbidity removed 86 31% − 63% (100% − 86 31%)

86.31% + 8.38%

94 69%

3 In a like manner it can be calculated that the purification after 4 turnovers is about 98 percent, after 5 turnovers, is 99 3 percent, and up to 99 99 percent after 10 turnovers (fig 1)

TURBIDITY EQUILIBRIUM

The preceding calculations show the application of purification by consecutive dilution to a pool not in active use The daily increment of dirt introduced by bathers, the wind, and other means is also removed in accordance with the same law The results of the additions of such daily increments will be an increase in the turbidity of the water up to a certain point, after which the turbidity will remain practically constant subject only to fluctuations in the daily increment and the efficiencies of the operation used The amount of this accumulation and the time required to reach an equilibrium depend on the turnover rate (ratio of water volume added per 24 hours to the pool content of the pool and on the operation and the dirt load variation

A hypothetical example is to assume a daily increment of dirt equal to that in the pool at the start of the operation and either a 100 percent filter efficiency (for recirculation pools) or clean entry water (for flowing through pools)

Let S = original dirt = daily increment

Turnover rate = 1 per 24 hours

S_n = dirt remaining after n days operation

$S_{(n-1)}$ = dirt remaining on day preceding n day

Removal per turnover = 63% (assumed)

Then

Day	$S_{(n-1)}$	$S_{(n-1)}+S$	$S_n = 37\% \left[S_{(n-1)}+S\right]$
1	1 00S	2 00S	0 74S
2	0 74S	1 74S	0 6438S
3	0 6438S	1 6438S	0 6082S
4	0 6082S	1 6082S	0 5950S
5	0 5950S	1 5950S	0 5902S
6	0 5902S	1 5902S	0 5884S
7	0 5884S	1.5884S	0 5877S
8	0 5877S	1.5877S	0 5874S
9	0 5874S	1.5874S	0 5873S
10	0 5873S	1.5873S	0 5873S

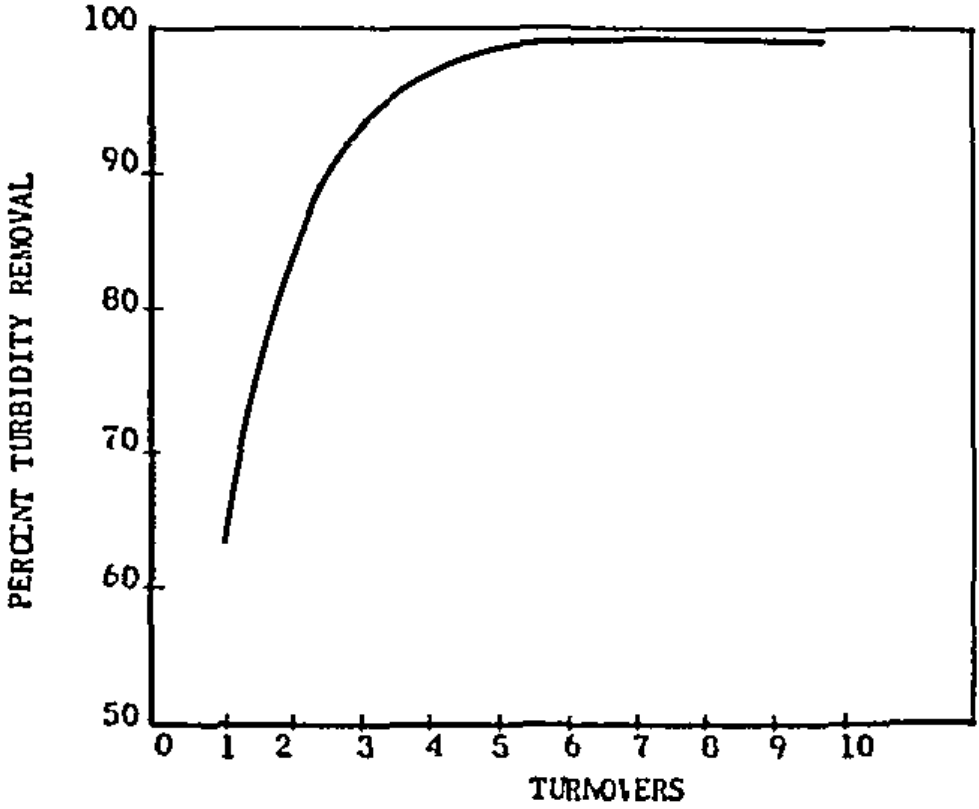


Figure 1. Turbidity removal from water by continuous dilution.

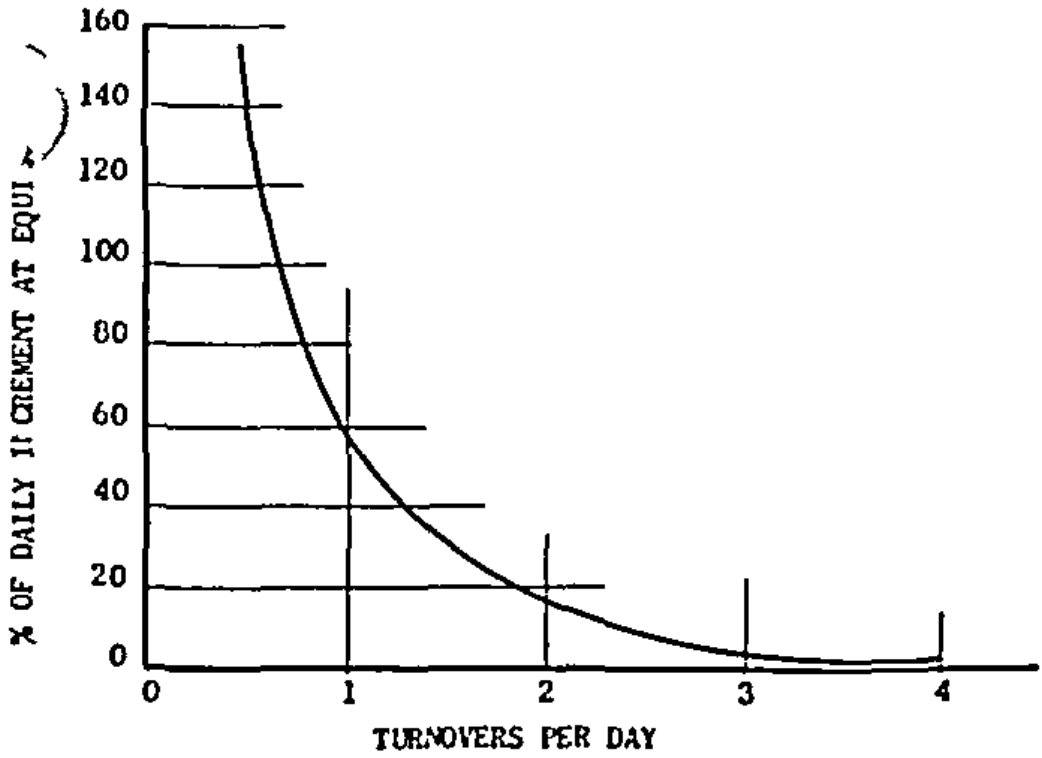


Figure 2. Turbidity equilibrium curve for various turnovers per day.

It is thus shown that, for a pool with a daily turnover rate equal to 1, equilibrium will be reached at the end of the ninth day when the accumulated turbidity in the pool will be 58 percent of the daily increment of dirt. With 2 turnovers per day and using a turbidity removal of 86 percent (fig. 1), equilibrium will be obtained in 4 days with a turbidity of 16 percent of the daily increment. In a like manner and using appropriate purification efficiencies (fig. 1), it can be determined that 3 turnovers per day will result in a balanced load of about 5 percent in 3 days and 4 turnovers per day will result in a balanced load of about 9 percent in 2 days. On the other hand, with a half turnover per day, turbidity will accumulate for 19 days with equilibrium at about 155 percent of the daily increment. Figure 2 illustrates these data.

APPLICATIONS

The logic of the 8 hour turnover requirement is readily explained by a critical review of the percentages of treatment and the equilibrium loads obtained by an 8 hour turnover as compared with the longer turnovers. Experience has supported this requirement as pools cannot be maintained in a clean, sanitary manner unless adequate dilution of turbid water with clean water is provided. Continuous operation is essential because an 8 hour turnover system operated only 8 hours per day is essentially equivalent to a 24 hour turnover system operated continuously.

Removal of bacteria cannot be calculated in the same manner as the mechanical removal of turbidity because bacterial life is influenced by temperature, time, food supply, and light. Properly controlled chlorination is the means of maintaining low bacterial counts. It, in turn, is influenced by the concentration of bacteria, amount of organic matter present, pH, efficiency of clean water distribution, and other factors. In a well designed and well-operated pool, control of these influencing factors is pertinent.

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TECHNIC FOR DIFFERENTIATING AND PRESERVING PROTOZOA IN FECES[1]

AUGUST J BUCK *Chief Hospital Corpsman USN*
WILLIAM H WELLS *Lieutenant, junior grade MSC USN*
JOHN R VAIL *Hospital Corpsman, first class USN*

THE identification of the cysts and trophozoites of the intestinal protozoa in feces by direct-saline and other temporary preparations is frequently difficult Although the saline and iodine smear methods are rapid and simple their diagnostic value is limited In some laboratories, a routine procedure is the preparation of permanent iron hematoxylin mounts from all positive stool specimens when identification of the protozoa is in doubt Although a number of modifications of the original hematoxylin technic have been made (2), primarily for the purpose of shortening the procedure they are still time-consuming and difficult Furthermore these long staining procedures are often impractical in small laboratories, especially aboard ship, where time and facilities are limited The need for a rapid technic using a single solution in which the staining reactions of the organisms are comparable to those found with the permanent hematoxylin methods prompted studies which resulted in the relatively simple technic here described Although further research is necessary, the favorable results consistently obtained prompted the publication of this report to allow its evaluation by workers in other laboratories

MATERIALS AND METHODS

The technic to be described is based on the wet fixation and staining of the organism with a mixture containing a single dye, brilliant cresyl blue Of about 30 different dyes screened during the study brilliant cresyl blue appeared most promising Although an evaluation of brilliant cresyl blue as a stain for amebas has been reported (3 4) the use of this dye has been restricted to

(1) U S Naval Medical School New London Naval Medical Center Bethesda Md
(2) Craig C F Laboratory Diagnosis of Protozoa Diseases 2d edition Lea & Febiger Philadelphia P 1948.
(3) Brown D C Effect of staining reagents on certain features of Endamoeba histolytica Proc Soc Exper Biol & Med 28 255-257 Dec 1930
(4) Bremer A M Some practical staining for amoebic and some observations on laboratory diagnosis South Africa Med J 21 550-554 Aug 9 1947

vital staining methods devised primarily for the detection or identification of living organisms Boemer *(4)* described a vital staining technic in which a mixture of brilliant cresyl blue and eosin was used in wet preparations He observed that particles of brilliant cresyl blue were absorbed by *Endamoeba histolytica* when the proportion of that dye was increased In our investigation we found that this dye when used with various fixatives was rapidly absorbed by both the trophozoites and cysts of the various intestinal protozoa

After study in this laboratory a staining solution with the following formula was evolved

Brilliant cresyl blue (N F Biological)	2 0 grams
Methanol	75 0 cc
Formaldehyde (U S P)	5 0 cc
Acetic acid glacial (U S P)	2 5 cc
Phenol (U S P)	2 5 cc
Distilled water	15 0 cc

Method of preparation Thoroughly dissolve 2 grams of brilliant cresyl blue in 75 cc of methanol To this solution add 5 cc of formaldehyde, 2 5 cc of glacial acetic acid 2 5 cc of phenol and 15 cc of distilled water After the solution is thoroughly mixed it is ready for immediate use No filtration is required The liquid phenol is prepared by placing a bottle of phenol crystals in a hot water bath until liquefaction occurs Best results are obtained when the ingredients are used in proportions as given in the above formula Should a weaker stain be desired the solution may be diluted with distilled water The total volume of water may be increased to as much as 50 cc without complete loss of the staining qualities The solution is stable and if stored in tightly stoppered brown glass containers may be kept for long periods without deterioration Quantities of this solution have been stored in this laboratory for 6 months without any noticeable change in staining properties

Procedure Wet stained preparations are made as follows A small portion of the fecal material is mixed in a large drop of the staining solution on a clean slide After a smooth emulsion is obtained a coverglass is applied and an immediate microscopic examination may then be made Cysts and trophozoites may be detected with the low power objective (× 100) but a greater magnification using high dry (× 430) or the oil immersion (× 970) is required for detailed study of the organisms and may be necessary in locating the smaller forms of intestinal protozoa Both the trophozoites and cysts due to their characteristic refractility stand out clearly against a dark blue background

CHARACTERISTICS OF THE FIXED STAINED PROTOZOA

Intestinal amebas Trophozoites and cysts of the intestinal amebas are immediately fixed, with minimum distortion, on contact with the stain, the pseudopods of the trophozoites frequently being fixed in an extended position (fig 1A) The staining reactions of both trophozoites and cysts are essentially the same



Figure 1 (A) Endamoeba coli *trophozoite with extended pseudopods* (B) E coli *mature cyst* (C) E histolytica *young cyst* (D) E histolytica *mature cyst* (E) Endolimax nana *mature cyst* (X 1200) (*Photomicrographs by W F McLaughlin HMC, USN*)

(fig 1) Penetration of the dye is extremely rapid Immediate identification is possible because the differential characteristics of the organisms are as diagnostic as those observed in iron hematoxylin preparations Nuclei are distinct, the blue black chromatin granules of the nuclear ring and the karyosome being in marked contrast to the pale blue cytoplasm The dark blue chromatoid bars of *E histolytica* (fig 2) are sharply defined Glycogen vacuoles, as seen in *Iodamoeba butschlii* (fig 3), remain unstained and appear clear against the blue background

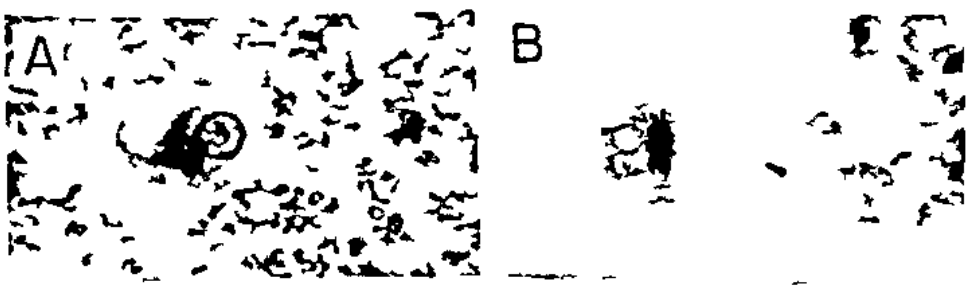


Figure 2 (A) E histolytic *uninucleate cyst with chromatoid bars and vacuole* (B) E histolytica *mature cyst with large chromatoid bar* (X 1200) (*Photomicrographs by W E McLaughlin HMC USN*)

Various cytoplasmic inclusions, such as bacteria stain dark blue, whereas ingested erythrocytes stain black (fig 4)

Flagellates Similar staining reactions are observed with the various species of intestinal flagellates, the nuclei axostyles fibrils, and flagella being clearly demonstrated Cysts and trophozoites are readily stained as is shown in figure 5

These findings are based on observations of the various intestinal protozoa as they appear in wet fecal preparations using the staining solution here described Although the staining reactions of the individual organisms as well as of the different species are slightly variable both in the intensity of the stain and the rapidity of dye penetration this variation is so slight that immediate diagnosis is not impaired



Figure 3 Iodochlamydia with glycogen vacuole (× 1200) Figure 4 Entamoeba histolytica trophozoite with ingested erythrocytes. (× 1200) Figure 5 Giardia lamblia cyst (× 1200) (Photomicrograph by W E Laughlin HMC USN)

PRESERVATION OF STOOL SPECIMENS

An important characteristic of the solution is that it may be used as a preservative for fecal specimens without loss of its diagnostic value Stool specimens which are collected at some distance from a diagnostic laboratory may be preserved in the solution for transit As a preservative the solution is used as follows 1 part of the fresh stool specimen is thoroughly mixed with about 5 parts of the solution in a glass vial or similar container Such specimens may be examined weeks later, provided the container is tightly stoppered Permanent wet preparations may be made by sealing the cover slide with a ringing material Slides in our collection prepared in this manner a year ago show no apparent loss of organisms or fading of the stain In

preparing the accompanying photomicrographs, permanent wet mounts were used, some being several months old

DISCUSSION

All observations are based on our use of this solution for the wet fixed staining and preservation of intestinal protozoa in fecal preparations

The advantage of this technic is the fact that it makes possible an immediate identification of protozoa in wet preparations and should prove of value in diagnostic work The simple staining solution may be rapidly prepared from materials that are inexpensive and readily available It is also of value as a preservative for stool specimens found to be positive for protozoa Feces may be preserved and later used as required in preparing temporary or permanent mounts for demonstration or teaching purposes Specimens preserved in this manner, examined at intervals over a period of 9 months, showed little or no distortion of the organisms and no apparent depreciation of diagnostic features

During our study, positive stool specimens were examined both with this method and with iron hematoxylin For diagnostic purposes, our method compared favorably with, and in some instances was superior to, the much longer and more complicated iron hematoxylin procedure

SUMMARY

A fixing staining solution, containing a single dye, brilliant cresyl blue, is of value in the rapid diagnosis of protozoa in feces It may also be used as a preservative for fecal specimens The staining characteristics of the intestinal protozoa are similar to those described when permanent iron hematoxylin methods are used

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Th Phy At mi D f Atom c Pr c pl B l g R ct on d Organiz t for M d l D f by *Th d P S* M D F A C P A oc t Cl l Pr f or f M d Un ty f C lorad S h l f M d c Ch f f M d l S Vet ra Adm tr t Hos p t l D M mb f Ad ory Staff to D rect r f Ct l D fen Stat f C l rad M mber f Di t r C mm s on C l rad S t M di l Soc ty C l l MC USAR F w d by *J m J W g* M D M A C P P f or f M d in Un ty f C lorado S h l of M d c 308 pag ill trat d Th Y B k P blish l c Ch g Ill 1953 P c $6

D s of M l A St dy P th l gy by *R ym d D Ad m* M A M D A ociat Cl l P f or f N l gy H d M d l Sch l Ch f f Neur l g l S Ma ch tt G ral H p tal F me ly Vi t g N l g st d N r path log t N ur log c l U t Bost C ty H p tal *D D y B oum* M D D Ph l F R C P J m J k P t m Pr f of N ur l gy H rv rd M d l S h l D c r N ur l g c l U d N ur l g t -Ch f B ton C ty H p tal d *Ca l M. P n,* M D Forme R d t P th l gy M llory In t t t f P th l gy B ton C y H pital 556 pag 347 ll trat P l B Hoeb Inc N w York N Y p bl h 1953 Pr $16

P y hiatr c D t ona y W th E cy l p d c T tm t f Mod T m by *L l d E H* M D Formerly P f or f P y hiatry C ll g f Phy d Surg C l mb U ty N w York A t t D t N w Y k St t P y h t In t t t d H p t l d *J ob Sbat ky* Ph D R ch L b N w York Stat P ych t c I t t d H p t l 2d d t on w th ppl me t 781 pag Oxford U ty P N w York N Y p bl h 1953 P ce $15

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I d dual d C mm ty H lth by W ll m W *St l* M D M P H A oc t P f or f P bl H l h U t s ty of California Be k ley 492 pag ll trat d Th Bl k st C N w Y k N Y p bl h 1953 Pr c $6

CAUSES OF REDUCED VISION IN INDUCTEES

WILLIAM G HOPKINS *Captain, USAF (MC)* (1)

THIS study was made to emphasize the importance of a careful ocular examination in inductees whose unaided vision in each eye is less than 20/20. Many patients have been admitted with a diagnosis of amblyopia, cause unknown, line of duty. Several discovered their decreased vision accidentally when closing one eye to shoot a rifle or having it covered with a patch. Others were malingerers. In some patients a vision of 20/20 in each eye was recorded on the first examination. Usually the decreased unilocular vision had been present since childhood. A significant refractive error or a strabismus was usually the underlying cause of the amblyopia. In each case visual acuity had been measured with both eyes open. Corrigible defects were found to be present, but the uncorrected vision had recorded on the physical examination for induction.

The data presented was obtained from the records of men for military service of inductees at Maxwell Air Force Base, Ala. The routine procedure consisted of an initial ocular examination in the flight surgeon's office. Both unaided and aided visual acuity was recorded. If the vision was not corrected to 20/20 in either eye a further study was made. Manifest refraction, funduscopic and external examination and study of the ocular muscles were done.

This study covers the period from January 1951 to November 1952 and the examination of 20 807 inductees. Of these 242 (1.1 percent) had defective vision due to either organic changes in the eye or to amblyopia ex anopsia. Table 1 summarizes the various causes for reduced vision in the total series of amblyopic patients.

The patients with amblyopia due to a refractive error were divided into various groups (table 2) and 6 other amblyopic inductees were seen on whom a manifest refraction was not recorded. Their physical examination stated that the poor vision was due to either a high degree of hyperopia or astigmatism in the eye with the reduced vision. There were also 1 patient with unilateral amblyopia associated with a constant strabismus

(1) 3810th Medical Group, Maxwell Air Force Base, Ala., at the time of writing; now with 3021 8th Avenue, Pueblo, Colo.

The amblyopic eye was the squinting eye and the other had 20/20 vision or was correctable to 20/20 The refraction was not recorded in these patients

TABLE I *Ca s / d d*

Ca	N mbe	I t nt
Les on of cor	24	7 3
I f ir	4	1 2
Cat act	40	11 7
Conge t l d f ct	20	5 8
Atr phy f pt	9	2 6
Mi lat d	45	13 1
E ucle t on	3	0 8
P fract or	182	53 2
Str b mus	15	4 3
T t l	342	100 0

Of 20 amblyopic patients with a hyperopia of more than 3 5 diopters and with reduced vision in 1 or both eyes only 3 (15 percent) had 20/20 vision in the better eye If the spherical equivalents (*e*) are calculated the more hyperopic was the more amblyopic eye in all but 2 patients Patients with a high degree of hyperopia even though their refractive error is corrected often have reduced vision in 1 or both eyes This has existed since birth and cannot be attributed to military service

Of 49 amblyopic inductees who had a refractive error of less than 3 5 diopters and a refractive difference between the 2 eyes of less than 1 5 diopters 15 (36 percent) had some form of heterotropia Ten of these had a constant esotropia and 3 had a constant exotropia with the amblyopic eye deviating There were single cases of alternating esotropia and alternating exotropia with vision reduced in both eyes Nine patients in the series demonstrated some form of anisometropia 7 of these were more hyperopic and 2 more myopic in the eye with the reduced vision No cause for the reduced vision could be found in 20 inductees (47 percent) of this group A more thorough examination would have reduced the number of patients in whom no cause for the amblyopia was found

In 73 inductees who had amblyopia with anisometropia and/or astigmatism of more than 1 25 diopters it was observed that as

(2) The phe ical q l s be lg be ic m f the phe nd half be yl a-

\ number of cataracts were seen in this study Twenty-one (o2 percent) were traumatic in origin and 10 (?o percent) were congenital There were single cases of lenticonus and subluxation of the lens Two secondary cataracts were seen Sufficient data was not available to cla sify 5 of the cataracts

Inflammation and trauma accounted for the majority of central chorioretinal lesions \n inflammatory basis was thought to be present in 22 (48 8 percent) of the inductees and trauma was held responsible in 14 (31 percent) The cause of the macular lesion was unknown in 14 patients

Numerous causes for ocular disabilities were listed under congenital defects Eleven patients with lateral nystagmus and 1 with cyclic nystagmus were found Two inductees had bilateral pigmentary degeneration of the retina and there were single patients with each of the following congenital or postnatal defects persistent hyaloid artery congenital retinal fold microphthalmus, coloboma of the optic nerve cyst of the optic nerve and medullated nerve fibers thought to be extensive enough to cause a decrease in vision

Of the 9 men with an optic nerve atrophy 2 had a positive S T S Two gave a history of trauma of the head 1 showed signs of increased intracranial pressure on a skull roentgenogram and 1 had a questionable history of optic nerve atrophy in his family Three of the inductees had had an enucleation of 1 eye

Nine hundred and seven consecutive refractions were reviewed to see what percent showed an anisometropia of more than 2 diopters and to determine if any of these had 20/?0 vision in each eye Twenty seven patients with anisometropia of more than 2 diopters were found Eight of these had 20/20 vision in each eye If the spherical equivalents of each eye were calculated 3 of the 8 patients would have had a minus spherical equivalent Anisometropia did not exceed 3 diopters in any patient

COMMENT

Sugar *(3)* reviewed a series of ?00 patients with amblyopia and found that anisometropia is the chief cause for amblyopia in a nonsquinting eye and that a constantly deviated eye has reduced vision \braham *(4)* stated that more than 2 diopters of astigmatism or 5 diopters of hyperopia are factors in causing amblyopia \ careful screen test is essential to elicit squint in some patients If the examinee does not fix centrally with the amblyopic eye a deviation may be missed By moving the muscle

(3) Sug H S S ppr ion mbly pia Am J Oph h 27 469-476, May 1944
(4) Abraham S V Ambly pia Is ifica ion w h port of ca Ar h Oph h 12 397 402 Sept 1934

light in a vertical plane and observing a following movement of the uncovered eye, it can quickly be determined whether or not the eye is fixing on the light

SUMMARY

The most frequent causes of reduced vision in inductees are some type of anisometropia or a muscle imbalance An ocular examination including refractions should be made on all inductee who have less than 20/20 vision in each eye so that further ocular complaints may be properly evaluated The measurement of visual acuity should be made separately for each eye Examinations of the fundus will reveal organic causes for reduced vision Needless hospitalization will be avoided and money will be saved for the government if more thorough ocular examinations are made and recorded on entrance in the service

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Friends of the Armed Forces Medical Library

THE second meeting of the Friends of the Armed Forces Medical Library will be held in Washington, D C 23 October 1953 under the chairmanship of Henry R Viets, M D of Boston This organization supplants the now disbanded Association of Honorary Consultants to the Army Medical Library and its purpose is "to promote knowledge of, and interest in, the functions resources and services of the Armed Forces Medical Library, and to support programs for its development"

Membership in the Friends is open to all interested persons and the dues of $2 per year are used to support the Armed Forces Medical Library *News* and similar projects Further information may be obtained from the Secretary treasurer Friends of the Armed Forces Medical Library, Seventh Street and Independence Avenue S W Washington 25, D C

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A Atl s f Surg c l E p ur f th E tr m t e by *S m W B ks* M D A oc at P f sor of Orth pa d Surg ry Northwe m U ty M d c l S hool Att d g Orth p d c S g on Ch g M morial Hos p tal d Woodlaw H p t l d *Ha ld L fma* M D Ph D A oc t Pr f sor of Surg ry a d D ctor of E p r me t l S tg y Nor hw t rn U y M d l S hool Associa Att nd g Surg Mt ha l R Ho p tal 391 pag Il trat d W B S u d C Ph l d lph P p bl h 1953

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Th Gold H d d Ca by *W ll m M M h l* M D A w d s w th for w d by *J m J W g* M D d pref e by *W ll am J K rr* M D t in g th t d tll tr t on f h 5th d on l d g th od t by *G g C P b y* d h tat on 18(pag Il rat d Ch l C Th ma P bl h Sp gf ld Ill 1953 Pr $6 50

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DISLOCATION OF THE CARPAL LUNATE AND NAVICULAR BONES[1]

WILLIAM G PHILPPE *Captain, MC USA*

RALPH E REINER *Colonel MC USA*

FRACTURES of the navicular and dislocation of and around the lunate bone represent about 1 5 percent of all fractures and dislocations of the skeleton [2]

The 4 types of dislocation of the lunate bone in order of increasing frequency are

1 Posterior dislocation due to a volar hyperflexion injury to the wrist (Other dislocations occur as the result of forces on the palm of the dorsiflexed hand)

2 Retrolunar dislocation of the capitate bone This is a relative anterior dislocation of the lunate bone and is manifested by displacement of the capitate bone dorsally, the lunate bone maintaining its normal position on the radius [3] but nevertheless suffering some interference to its blood supply

3 Forward dislocation of the lunate This consists of a tearing of the dorsal ligaments to the lunate bone but not of the anterior ligament from the radius Here the distal articular surface faces volarward There is much pain, limitation of wrist motion, and pressure against the flexor tendons resulting in semiflexion of the wrist and fingers There may be severe pain and sensory changes due to pressure on the median nerve Fullness will be noticeable on the volar aspect and a hollow may be seen on the dorsum of the wrist [3 4]

4 Complete dislocation In this type all the ligaments are severed and the bone comes to lie in the distal volar forearm This condition is associated with inevitable avascular necrosis and early excision is indicated [3]

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(1) Book Army Hospital Fort Sam Houston Texas

(2) Special Kelly Text Book of Fracture and Dislocations 4th edition revised L & Febiger Philadelphia P 1942

(3) Watson-Jones R Fractures and Joint Injuries 4th edition Williams & Wilkins Co Baltimore Md 1952

(4) Compere E L and Bonnin S W Postgraduate Handbook of Fracture Treatment 3d edition New York Blakiston Publishing Co Chicago Ill 1952

Manipulative reduction of the forward dislocation consi ts of traction applied manually to separate the capitate bone from the radius and gradually flexing the wrist while the operator applies *thumb pressure on the lunate bone (3) The Conwell method of* traction hyperextension molding of the dislocated lunate bone to the radius and sudden flexion (thereby trapping the lunate bone) has its proponents Bohler s method that of continuous longitudinal traction for *10 minutes* on the extended fingers with countertraction above the flexed elbow (90) is reported to be very satisfactory Reduction by this method is believed to be due to forces brought into play against the lunate bone by the taut flexor tendons *(4)* Manipulation after 2 weeks of dislocation is fruitless Open reduction with its inescapable effect on circulation to the lunate bone usually results in avascular necrosis Immobilization in slight flexion for 3 weeks is generally recommended The following case report illustrates the advantages of using mechanical traction under anesthesia



Figure 1 (A) Lateral and (B) anterior posterior views of the right wrist showing complete dislocation of the lunate and navicular bones.

CASE REPORT

A 31 year-old man injured his right wrist in an automobile accident 23 October 1952 On admission to this hospital 36 hours later he had deformity of and severe pain in his right wrist Roentgenograms of the wrist showed a complete dislocation of the lunate and navicular bones with the lunate taking a position in the distal forearm (fig 1) Examination of the right upper



Figure 2 Late al view of the wrist Arrow shows persistence of dislocation of the lunate bone

extremity revealed anesthesia in that part of the hand supplied by the median nerve but no circulatory interference

Under brachial block anesthesia, the navicular dislocation was reduced by manual traction and manipulation, but the lunate bone remained unreduced (fig 2) Forced manipulation succeeded only in redislocating the radionavicular joint Because of swelling and the belief that mechanical traction was necessary a

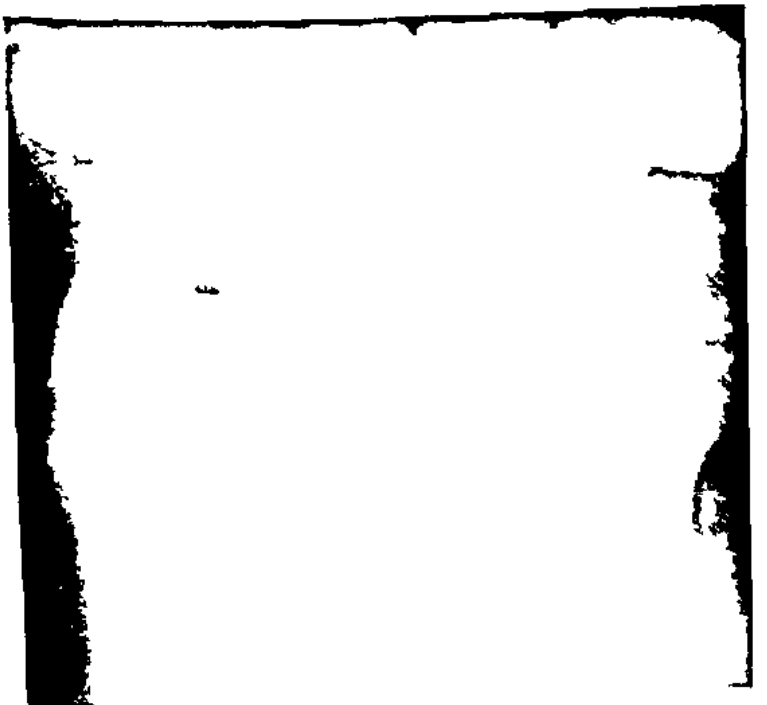


Figure 3 Antero-posterior view of wrist showing mechanical separation of carpal bones

plaster splint was applied and the hand was elevated On the following day mechanical traction was applied using a Weinberger finger trap The carpal bones were easily separated the lunate bone was reduced without difficulty (fig 3) and the wrist was immobilized in slight flexion (fig 4) After 3 weeks of immobilization active use of the right hand and wrist was started The hyposthesia completely resolved and normal function returned



Figure 4 Lateral view of the thoughed to fina lar and lunat bones

DISCUSSION

It is too early to determine the amount of damage to the lunate bone Its blood supply has probably been completely destroyed but early excision of this carpal bone is not justifiable in view of the resulting poor function of the wrist following its removal This case is presented to illustrate the difficulty in attempting to reduce a complete dislocation of the lunate bone by manual traction and manipulation and the comparative ease with which it can be accomplished by using mechanical traction

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Ep d m ca n Colon 1 Amer ca by *J hn D ffy* 274 pag ill tr t d L na Stat U y P B ton R p L p bl h r 1953 P ce $4 50

REFLEX ANURIA [1]

EDRIN M TOMLIN *Lieutenant MC USN*

THOMAS N QUILTER *Lieutenant MC USN*

ANURIA complicating retrograde pyelography is fortunately rare Because of its rarity, the following case is reported Anuria resulting from ureteral trauma due to catheterization or calculi would seem to be on the basis of a reflex neural stimulation producing renal shutdown Although it is so described by many authors, the experimental evidence for this mechanism is contradictory The experiments of Trueta et al [2] appeared to give the answer These observers reported a vascular shunt by way of juxtamedullary vessels following sciatic stimulation in animals, resulting in cortical ischemia and anuria Subsequent experiments by Barrie et al [3] and Block et al [4] revealed cortical ischemia from neural stimulation and vasoconstriction but no decrease in glomerular filtration Moyer and Handley [5], similarly, were unable to find experimental evidence to support Trueta's theory of a renal vascular shunt

Regardless of the mechanism of reflex anuria within the kidney, the problem of maintenance of the patient with this condition is little different from that encountered in any other anuria The regimen of limitation of fluids, maintenance of the electrolyte balance, and supportive therapy is well established Attempts to induce diuresis by anesthetic agents have been made for many years This method of treatment has been dismissed by many clinicians who believed that it offered no benefit in other types of anuria It was however, used successfully in this case

CASE REPORT

A 29 year old man was admitted to the urology service of this hospital on 11 October 1951 His admission complaints were acute right renal colic of 6 hours duration, nausea, and vomiting He had no gross hematuria and had had no previous similar epi

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(1) U S Naval Hospital National Naval Medical Center Bethesda Md

(2) Trueta J Barclay A E Daniel P M Franklin K J and Prichard M M L Studies of the Renal Circulation Charles C Thomas Publisher Springfield Ill 1948

(3) Barrie H J Catch G W and McCulloch E A Reponse of renal cortical vessels of rabbit to adrenalin Inquiry as to Trueta shunt Brit J Surg 39 465-469 Mar 1952

(4) Block M A Wilkins K G and Mann F C Certain features of vascular beds of cortex medullary and medullary glomeruli of kidney Arch Path 53 437 443 May 1952

(5) Moyer J H and Handley C A Physiological evaluation of renal vascular shunt Am J Physiol 165 548-553 June 1951

sodes On admission his temperature was 99 ° F and there was tenderness over his right renal region, posteriorly His blood pressure was 110/70 Excretory urograms made on admission showed a normal left kidney and ureter His right renal pelvis appeared normal and there was stasis of the contrast medium in his lower right ureter Antispasmodics completely relieved his pain

On 12 October, a cystoscopy was performed There was slight narrowing in the posterior urethra on introduction of the cystoscope The bladder was normal The right ureteral orifice was edematous and injected Using No 6 (French) ureteral catheters, both ureters were easily catheterized No obstruction was encountered The pyelograms were normal It was believed that a small calculus had passed

The patient had moderate pain on the day following cystoscopy and his temperature rose to 101 F He was given dextrose intravenously morphine for relief of pain and aureomycin His pain continued on the second day following cystoscopy and supportive therapy was continued He did not void on that day At 1630 a urethral catheter was passed into his bladder but no urine was obtained His blood pressure was 160/78 and a serum urea nitrogen determination was 13 3 mg per 100 cc On the third day following cystoscopy his urinary output was 900 cc He was given 2 800 cc of fluids and it was thought that his day of anuria had been a false alarm but on the fourth day he excreted only 15 cc of urine in 24 hours His fluid intake was limited to 1 800 cc of which 1 000 cc was a 1/6 molar lactate solution His serum urea nitrogen was 41 3 mg per 100 cc His carbon dioxide combining power was 41 volumes per 100 cc

On the fifth day, by 1600 he had had no urinary output and on the basis of the hope that vasodilation would benefit him the anesthesiologist inserted an epidural catheter between the second and third lumbar vertebral arches and directed it upward within the epidural space for 5 cm An initial injection of 25 cc of 0 5 percent lidocaine 0 05 percent tetracaine and epinephrine was made A similar injection into the epidural space was repeated at 2200 The expected sensory changes were obtained on both occasions The patient passed no urine that day His serum urea nitrogen rose to 70 6 mg per 100 cc His fluid intake was limited to 1 150 cc On the sixth day his serum urea nitrogen was 75 mg per 100 cc His epidural block was repeated at 1000 and at 1600 At 1630 diuresis began By midnight his urinary output was 2 675 cc His serum chlorides dropped from 616 mg per 100 cc that morning to 302 mg per 100 cc at midnight

On the seventh day he was given 1 550 cc of fluids and his total urinary output was 5 975 cc Chloride replacement was ac

ce plished with 1,000 cc of normal saline solution given intra ve ously, and his serum chlorides were brought up to 422 mg per 100 cc His serum urea nitrogen dropped to 51 4 mg per 100 cc Again we thought that all was well, and the epidural catheter was removed, but on the eighth day, his urinary output totaled only 300 cc The epidural block was repeated at 1000 on the ninth day At 1240 diuresis began and by midnight, his urinary output was 3,500 cc His chlorides this time dropped to 168 mg per 100 cc On the tenth day, his urinary output was 2,700 cc , but the epidural block was repeated His serum urea nitrogen re ained at 39 3 mg per 100 cc On the eleventh day, his urinary output was only 500 cc , and his fluid intake was limited to 1,100 cc The epidural block was repeated On the twelfth day, he passed no urine His serum urea nitrogen was 32 8 mg per 100 cc The epidural block was repeated at 1400 and his fluid intake was limited to 1,900 cc

At 1930 on the thirteenth day, diuresis began On that day 7,200 cc of urine were excreted By giving sodium chloride in travenously and orally, a serum chloride level of 490 mg per 00 cc was maintained On the fourteenth day, the patient s luid intake was limited to 1,300 cc , and his urinary output was ,300 cc His serum urea nitrogen was 24 mg per 100 cc His erum chlorides were 442 mg per 100 cc On the fifteenth day is fluid intake was 3,300 cc , and his output was 2 500 cc His erum chlorides increased to 581 mg per 100 cc and his serum rea nitrogen returned to normal From that day until the end of is hospitalization, his output did not fall below 1,500 cc in any 4 hour period At no time was there any evidence of potassium ntoxication His urine never showed albumin or abnormal numbers f casts Subsequent renal studies, including a urea clearance est a dilution concentration test, a phenolsulfonphthalein test, n Addis count, and repeated urinalyses, showed no permanent enal damage

SUMMARY

True reflex anuria following ureteral catheterization though ire is encountered In the patient herein described, 3 distinct episodes of renal suppression occurred following retrograde pyelography Diuresis occurred each time following epidural blocks No permanent renal damage was demonstrable

sodes On admission his temperature was 99 ° F and there was tenderness over his right renal region, posteriorly His blood pressure was 110/70 Excretory urograms made on admission showed a normal left kidney and ureter His right renal pelvis appeared normal and there was stasis of the contrast medium in his lower right ureter Antispasmodics completely relieved his pain

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chemical methods but a pathology laboratory requires so much costly equipment that only well financed laboratories can afford an expensive commercial electrolytic decalcifier

Because such a device was not available in this hospital and study of bony tissue was common a simply constructed electrolytic bone decalcifier was made and after long use and critical evaluation has proved its worth (figs 1 and 2) It requires materials readily available to any laboratory at a total cost of about $31

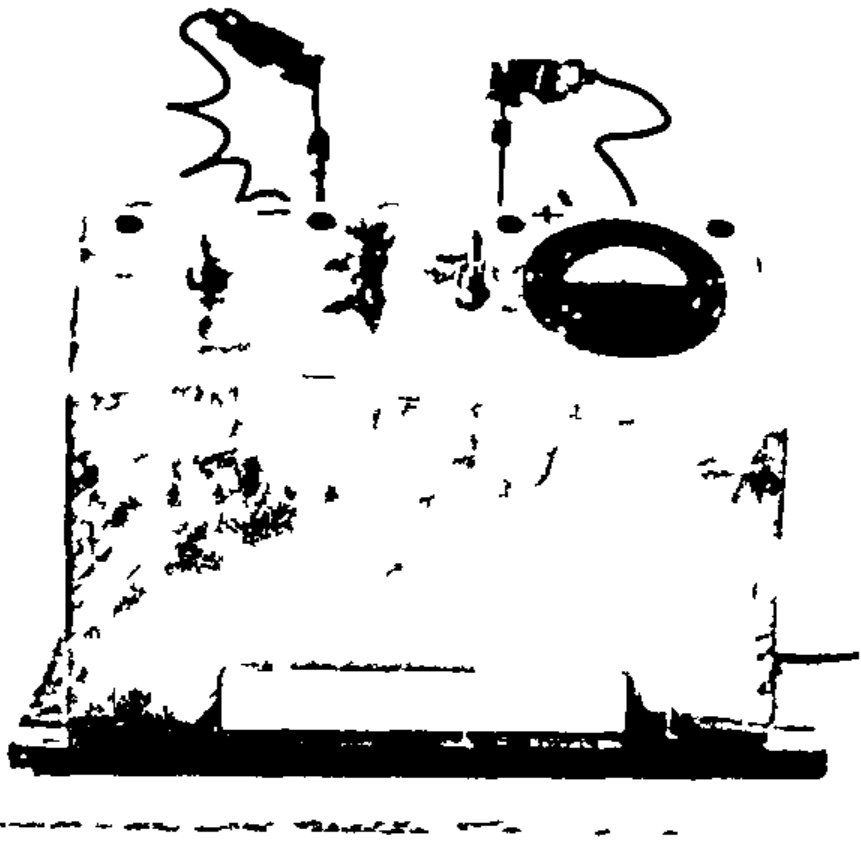


Figure 2 C t l panel f l t lyti d lcif er Left t ight Off wit h istor o t l k ob amm t he k t h nd mm ter

TECHNICAL DATA

This apparatus delivers 6 3 volts at 10 amp direct current (DC) The amount of voltage and current used for optimal efficiency is 6 3 volts with 2 6 amp The wiring is shown in figure 3 Amperage is controlled by using a 16 ohm variable resistor (potentiometer) The voltage is not affected with this resistor but remains at 6 3 volts \ 0 to 10 ampere DC meter should be installed in the control panel with a switch so that it does not remain in the circuit at all times becau e this would damage some meters

The electrolytic solution used consists of equal parts of 5 per cent formaldehyde and 10 percent hydrochloric acid Durin, use

...e temperature of the solution does not rise by more than 30 C, ... is well within the limits of safety for preservation of the ...logic features of the tissue The solution may turn pale ... after a few hours, but this does not interfere with the ... or injure the tissue We arbitrarily change the solution ... each new specimen

...Care must be taken thoroughly to seal the brass rod on the ...sitive electrode extending into the solution During the elec... process the exposed brass rod as well as the lead plate ... deteriorate, eventually rendering the electrode useless ... lead of the electrode needs replacing from time to time be...

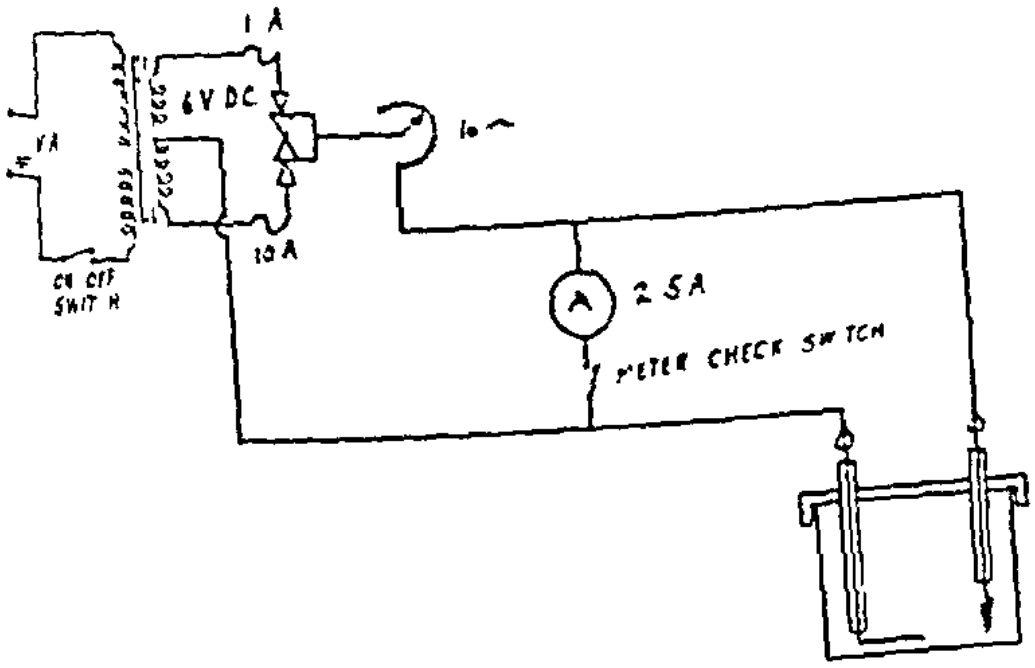


Figure 3 Wiring diagram

...cause of this deterioration With our model (figs 4 and 5), little ...or no deterioration of the negative electrode occurred What little lead precipitates at the cathode does not interfere with the stain ...n of the tissue and is easily washed with water from the tissue ...the electrode Maintenance is no problem

In testing and using the machine, little or no unpleasant odor was noted It does not overheat, so no temperature control is needed The amount of electrical energy produced is insufficient to cause appreciable shocks The use of 10 ampere electric fuses to protect the apparatus from electric failures is advised Table 1 shows the equipment needed and the approximate cost Table 2 shows the time required for decalcifying various tissues

With a pair of pliers, the platinum coil of the cathode can be varied in size and shape to fit the specimen, or variously sized and shaped cathodes can be made and merely interchanged in

TABLE 1 *P t us d nd pp ximat t*

P t	*C t (d ll)*
B ry h g s	18 00
Pl m w (22 gag)	1 50
L d	0 50
B z w ld g od	0 10
Al m um h g (opt nal)	0 50
W od h s g (opt l)	0 50
F (10 mp)	0 10
Cl p l d	0 30
B w	0 50
R bbe c ks	0 10
Amm	6 00
Sw t	0 50
El c l w ag	0 50
16-ohm t ble t to	0 25
Gl j t w th c t	1 20
Gl tub g	0 20
M cury	0 50
8 pe c t f mald hyd *a d 10 p t e t HCl*	*?*
T tal	31 20

the supporting lid The tissue must contact as much of the wire as possible Tying a specimen so that it tightly contacts several coils of the cathode is sufficient for rapid decalcification Chips of bone less than 1 cm in their greatest dimension can be treated by placing them in a gauze bag and tying it to the cathode

TABLE 2 *App o mat t m q d f d calc fy g ou t*

Typ of t s	*T m (hours)*
Lumbar ert b	3
R b	3
Ph la x f t	2
M t pal bo e	5
E t f b	5 2
O t bond n	4
Cal f d cy t f pl e	3
I a tooth	12

The sections for decalcification are usually cut to a thickness of from 3 to 5 mm The softness of the tissue can be judged during and after decalcification by bending it, piercing it with a sharp needle, or by palpation When the tissue is considered decalcified, it is washed in running water for 3 or 4 hours, then dehydrated, cleared, and embedded

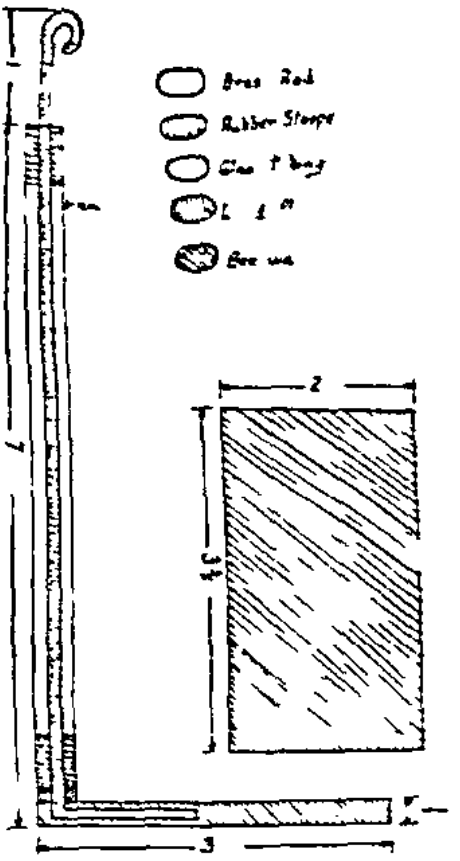


Figure 4. Diagram of the anode

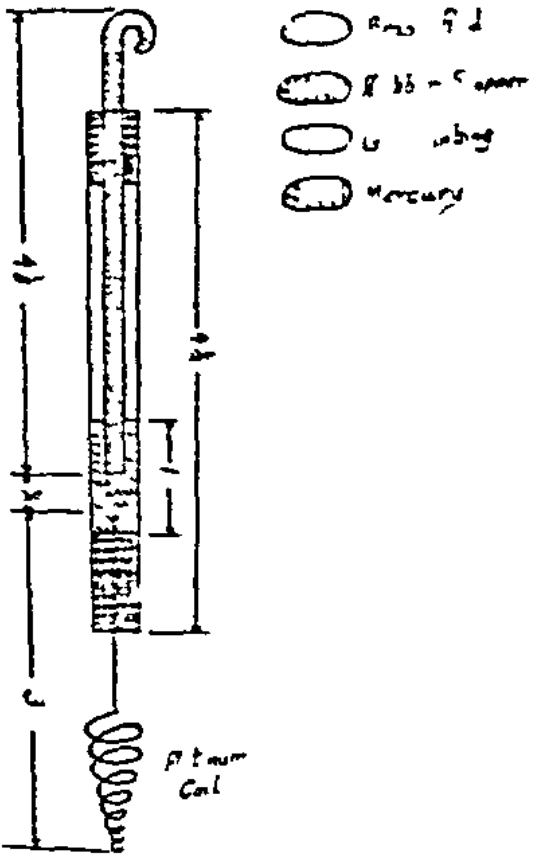


Figure 5 Diagram of the cathode

SUMMARY

An efficient, inexpensive, safe and simply constructed electrolytic bone decalcifier has proved to be a time saver for the pathologist and the surgeon and is especially valuable because it has no deleterious effect on the tissue being treated

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BOOK REVIEWS

How to be thy in Hot Climate by *Elinor T Calverley* M D 2d edition 286 Thomas Y Crowell Co New York N Y publishers 1953 $3 50

This book would be of benefit to who is contemplating a trip to tr climates The mate ed is easily under

stood even that which is semiprofessional in nature and deals with the various tropical illnesses The early chapters indicate the immunizations and equipment that will be necessary for any prolonged journey or assignment First aid measures for medical emergencies recognition of unsafe food and drink and methods of sterilization for water other liquids and suspected foods are adequately covered It is stated that women under 21 years old display low resistance to heat and humidity but later it is stated that women do well in the tropics There are several appendexes and tables which include diets lists of supplies for emergencies or early treatment of the sick and charts which illustrate tropical illnesses occurring in different sections of the world —*Lt Col E A Ricketts MC USA*

Office Orthopedic by Louis C Mead M D F A C S Attending Orthopedic Staff th Orthopedic Hospital Veterans Hospital Los Angeles County Hospital Cedars of Lebanon Hospital Los Angeles and Los Angeles Tuberculosis Sanatarium Monrovia California Assistant Professor of Orthopedic Surgery College of Medicine University of California Los Angeles 304 pages illustrated 2d edition 1953 Lea & Febiger Philadelphia Publishers

The title of this book is not entirely self explanatory The contents are well organized and the author goes farther than the descriptive title because much of the information the book contains can be applied to hospital patients as well as to office or clinic patients Although he does not attempt to discuss surgical treatment or hospital procedures this edition has been rewritten and new material included It contains descriptions of minor therapeutic approaches to orthopedic problems which are not found in many more complete textbooks on orthopedic surgery

Common complaints of the foot knee thigh hip back the neck and shoulder and hand are divided into respective chapters A chapter on Limp in a Child is alone worth the price of the book A final chapter How to Examine Orthopedic Cases for the Law Court, is an appendage to the first edition and is worthwhile for those for whom the book is intended

This small handbook is a valuable addition to the libraries of hospitals orthopedic clinics general practitioners and surgeons who deal frequently with many of the complaints discussed in the text It is well illustrated Although it is not duplicated by other texts or handbooks on orthopedic problems it is not a substitute for the recognized textbooks on fracture treatment general orthopedics and operative orthopedics available —*Col H H Vaughan MC USA*

DEVELOPMENT OF THE ARMED SERVICES BLOOD, BLOOD DERIVATIVES, AND PLASMA EXPANDERS PROGRAM

MAE M LINK PA D (1)

THE Armed Services Blood Blood Derivatives, and Plasma Expanders Program has been in operation nearly 3 years, but its origin is rooted in the World War II period when a military blood and blood-derivatives program was established to supply whole blood for immediate use and to build necessary stocks of dried plasma At that time the armed services were responsible for the entire program but the American Red Cross acted as the procurement agency (2). With the cessation of hostilities, the military blood program was reduced to meet only the routine requirements in military hospitals The Armed Forces operated blood banks at 21 hospitals of which 4 collected approximately 300 pints and the remainder, from 50 to 200 pints monthly The processing laboratories of World War II were dismantled and equipment disposed of Excess plasma stocks on hand at military stations and depots were returned to the American Red Cross for distribution to civilian institutions (3) Because no mobilization plan existed for providing whole blood and plasma there would have been neither stocks on hand nor facilities for producing such reserves had a sudden national emergency arisen

This situation came to the attention of the medical planning facilities of the newly-established Department of Defense in the latter part of 1949 and early 1950 It will be recalled that in the 9 year period following the passage of the National Security Act in 1947, military medical planners continuously planned for an organization within the Department of Defense which would meet the military medical requirements of the nation In May

(1) Chief Historian, U S Air Force Medical Service

(2) Records for World War II period on file with Historical Division, Office of the Surgeon General, Department of the Army

(3) Summary prepared by Major P A W Beg Executive Officer, Blood and Blood Derivatives Group Directorate Armed Forces Medical Procurement Agency and on file R&BD Gp ASMPA

1949 there was established within the Office of Secretary of Defense a Medical Service Division with Dr Richard L Meiling as Director (4) On 1 July 1949 the Air Force Medical Service was established (5 6) and thereafter the Surgeons General of the Army Navy and Air Force acted as a team with the Director of Medical Services in determining the joint medical requirements of the Department of Defense It was in the course of the general survey of the military health resources that the lack of a coordinated blood and plasma program became apparent

A task force group was appointed on 26 October 1949 by the Director of Medical Services to study the entire problem and make recommendations to meet the blood blood derivatives and plasma substitutes requirements in time of peace and war Among the related problems considered were those of transfusion supplies and equipment the training of personnel in the technical aspects of procurement control and the torage and transportation of blood blood derivatives and plasma The report of the task force group submitted to the Secretary of Defense on 15 March 1950 was approved on 5 May (7)

PLASMA STOCKS

One activity of this task force group was to survey the commercial facilities available for processing blood into plasma to build reserves for use in the event of a national emergency At that time only 4 commercial laboratories were producing what was considered a nonprofit item with a small combined output (8) Contracts were made with these firms by the Armed Services Blood Group It was clear however that the Government would have to provide further incentive if commercial houses were to expand their production capacities to meet national stockpiling requirements Accordingly 3 companies were given contracts to develop government-owned processing facilities In the order of completion for production they were the Upjohn Company, Sharp & Dohme Inc and the Eli Lilly & Company These companies used their own buildings and the Government furnished the equipment and production facilities for them Eventually 8 commercial facilities were in operation In addition to the 3 laboratories utilizing government-owned facilities the others were Cutter Laboratories Berkeley Calif Hyland Laboratories and Courtland Laboratories

(4) Sec nd R port t h Sec tary of D f ns 1949 pp 118 123
(5) M mo Secret ry f D f 12 May 1949
(6) Gene l Ord 35 8 J 1949.
(7) T k Force P port fil B&BD Gp ASMPA
(8) They were Cutter Laboratories Berkeley Calif which had fractionation of plasma Hyland Laboratories Los Angeles Calif Courtland Laboratories Calif and Sharp & Dohme Inc Philadelphia P

Angeles, Calif Armour Laboratories, Fort Worth, Tex and E R Squibb & Sons, New Brunswick, N J

WHOLE BLOOD PROGRAM FOR FECOM

Before the recommendations of the task force group could be fully implemented, the Korean action developed a new requirement for whole blood which necessarily received first priority Although the 406th General Laboratory in Tokyo immediately established a blood donor service for supplying whole blood to Korea, it soon became apparent that additional support would have to come from the United States On 15 August 1950 the Far East Command radioed a statement of its daily requirements with a request that the first shipment arrive in Japan by 30 August *(9)*

In keeping with the task force report, plans were already under way to establish a Blood and Blood Derivatives Division (later called Blood and Blood Derivatives Group) within the Armed Services Medical Procurement Agency to serve as the focus of operations for implementing the Department of Defense blood program This group was to be responsible to the Director Armed Services Medical Procurement Agency and to maintain liaison with the Chairman Armed Services Committee on Whole Blood Plasma and Blood Derivatives Department of Defense At the time the request for whole blood came from the Far East, this organizational structure had not yet been completed *(10)* Nevertheless within a matter of days operations had begun under the supervision of the group A temporary whole blood processing laboratory was established at the U S Naval Hospital, Oakland, Calif approximately 50 miles from Travis Air Force Base Fairfield, Calif, the western aerial port of embarkation of the Military Air Transport Service for the Far East

The logistical plan followed for supplying blood to Korea similar to that used in World War II, proved highly successful *(11)* Group O" whole blood was collected in acid citrate-dextrose preservative solution by American Red Cross workers at their nationwide blood donor centers and delivered to the Armed Services Whole Blood Processing Center at Travis Air Force Base where it was processed and stored prior to shipment After processing the blood was placed in precooled

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(9) Summary prepared by Commander Mary T Sproul, MSC, USN Navy Representative on Blood and Blood Derivatives Group and Armed Forces Blood Program Board ASMPA

(10) Colonel Charles B Kimmick, Jr., MC, USA, who had established the Army Blood Program in World War II was named the first Chief He was succeeded by Col Paul P Strohecker USAF (MC) in May 1952

(11) Kimmick, C B J Problems concerned with logistic handling of Blood Specimens Letter Walter Reed Hospital, 8 May 1951

BOOK REVIEWS

Imm ty Hyper t ty Se logy by *S d y R /// l* Sc D M D Pro- f of B t l gy Depa tm t of B t l gy d F pe m t l P th l gy St ford U sity S h l f M d c e 531 pag l l t t d Applet n-C t ry-Cr ft In N w Y k N Y p bl he 1953

This textbook includes all aspects of immunity and serology and is the best available for the entire field of immunology It is oriented toward resistance of host to bacteria viruses and toxins rather than antigen antibody reactions The major portions are necessarily allotted to serologic aspects because of the vast number of facts which have been accumulated relative to antigen antibody reactions The various phenomena included in the field are described in basic terms and by clear illustrations Over one fourth of the space is devoted to fundamentals Hypersensitivity resistance in typical infections and applied serology are treated in short separate sections As an indication of comprehensive coverage Taliaferro s reproduction-inhibiting substance ablastin is included in an excellent succinct discussion —*Lt Col L R Kuhn MSC USA*

H ma Blood Coagula ad It D ord by *Ro m ry Bigg* B Sc (Lond) Ph D (Tor) M D (L d) Gr duat A ta th D p rtme t of P th l gy Radcl ff I *firma* y Oxf d d *R* G *M / /* M A (Ox n) M D (Lo d) Cl I P th l g t t th R d l ff I *firma* y Oxford R dcl ff L ct Ha mat l gy U ty of Oxford 406 pag ll t d Ch l C Thoma P bl h r Sp gf eld Ill 1953 P $8

In the first 11 chapters of this book the authors discuss their observations and theories on the mechanism of blood coagulation Facts are presented clearly and objectively to form an excellent review of the coagulation process It includes new observations on thromboplastin which are of importance in the study of hemophilia and related conditions The last 9 chapters contain a description of the clinical syndromes associated with abnormal clotting in which the practical aspects of diagnosis and treatment are emphasized An appendix includes a differential diagnosis of coagulation defects as well as a detailed description of technical laboratory methods There is an adequate bibliography and a last minute addendum of a description of a new hemorrhagic disease This excellent book will be of interest both to the clinician and to the laboratory worker studying disorders of blood coagulation

—*Lt Col W W Bayliss MC USA*

AN APPOINTMENT PLAN IN LIEU OF SICK CALL

ROY S BIGHAM Jr Major USAF (MC) (1)

DON S WENGER Colonel USAF (MC) (1)

THIS report describes the operation and the results observed following the replacement of military sick call by an individual appointment system on 10 November 1952 To give students of a large number of technical schools access to nonemergency care without interference with class schedules, 2 daily sick calls were previously held at 0800 and 1300 hours in the base dispensary During duty hours this facility was devoted to sick call, venereal disease control, and emergencies The full time services of 5 medical officers were used

In establishing this system, an allocation 15 minutes per appointment was made In an 8-hour day, with 5 assigned physicians, 160 appointments could be made, and this corresponded to our average daily patient load of from 150 to 175 patients Any patient requiring emergency treatment is seen without appointment at the dispensary

METHOD OF OPERATION

A master chart showing all the appointments for the medical officers on duty in the dispensary is prepared daily by an appointment and reception desk This chart includes the patient s name, service number and organization, the time of appointment, and the names of the medical officers on duty Airmen desiring medical attention may report in person to the appointment desk or by telephone The patient's complaint is evaluated by the appointment clerk, who consults a medical officer when necessary, and the airman is given the earliest available appointment Consideration is given to the nature of his complaint, his off duty" shift (if a student), and the number of physicians available If the appointment clerk or physician decides emergency care necessary this "earliest available appointment" is made immediately by working in an extra appointment between scheduled cases Elective treatments may be deferred for several days if necessary The appointment clerk endeavors to

(1) U S Air F r Ho p tal Cha ut Air For Ba Ill Colonel Weng r is now on d ty n th Offic f th Surg Ge l U S A r Forc

assign each patient to the medical officer who is best qualified to manage his problem keeping appointments evenly distributed among the officers on duty

Using the master chart for the following day s appointments the dispensary night-shift airmen obtain records from the files and prepare individual appointment rosters for each medical officer These charts and roster are on each physician s desk at the start of the day If further appointments are made during the day the records are obtained and the individual rosters are posted at once When an airman reports to the appointment desk preferably a few minutes in advance of his appointment time he is given his examining room number and the name of the physician assigned so that he knows where he is to go and whom he is to see The medical officer having the charts and roster knows who can be expected at his examining room at any given time When an additional visit is necessary the examining officer prepares a return appointment form and inserts the proper date The patient gives this form to the appointment clerk who enters the time on it and records the appointment on the master chart The airman may show the form to his supervisor as evidence that he is to report for medical care at the time and date stated This form is also given to the airman by the appointment clerk when he makes an initial appointment in person There is no written verification for initial appointments made by phone but the time of the patient s arrival at the dispensary and departure is supplied by the appointment clerk on request

The plan described was initiated after notifying all concerned that sick call would be discontinued and that patients would be seen thereafter only by appointment This information was publicized in the base newspaper and in the daily bulletin Notices regarding changes in administrative procedures and the handling of reports were also published

DISCUSSION

Preliminary time studies of sick call have shown that the examination and disposition of a patient takes about 9 minutes but that approximately 90 minutes is wasted by the average patient while waiting in line to be seen The airman s arrival is anticipated and prepared for under the appointment system Time lost is reduced to that necessary for travel to and from the dispensary plus the actual period needed for the examination and disposition We have saved more than an hour of duty time per patient and this far outweighs the disadvantage of releasing men at odd intervals to report for medical care The airman who reports to a medical officer at a specific time and returns to the same physician if necessary on another appointment knows he

is receiving individual attention He is more courteous and cooperative than previously He feels that the quality of his care has improved, and he is less apt to complain about it We have not received any official complaints concerning medical care in the dispensary since the institution of the appointment plan The elimination of waiting has relieved congestion and crowding, and permits control of the few men present The "detail-dodger" no longer has the opportunity to spend a few hours on sick call Our patient load has decreased from 12 to 15 percent.

A routine appointment is usually available the same day, if requested prior to 1300 hours, and on the following morning for later calls The dispensary personnel have found their operations to be more efficient because the even flow of patients prevents the periodic overloading of the facilities available Because each medical officer usually treats patients in his own field of interest, he takes a more personal interest in them The 15 minute intervals are sufficient to allow a little extra time, if necessary, and there is no compulsion to rush the patient through because the day's work is set in advance The plan has decreased referrals to specialty clinics with resultant economy of time and personnel

Our plan has been devised to meet a uniform daily load of patients Epidemic or seasonal increases are predictable and can be met by the assignment of more medical officers or by decreasing appointment intervals We have recently experienced a 2 week epidemic of respiratory diseases, including influenza, when the daily patient load was as high as 370 (normal 150) without any disruption of the plan Expansion and contraction was automatic in accord with a predetermined schedule which provided for extra officers to be called in but released to their primary assignment when no longer needed

SUMMARY

The operation of an appointment plan in lieu of sick call saves time and duty personnel, and has resulted in improved doctor patient relations These results have been obtained by distributing workloads evenly throughout the day among the medical officers and airmen assigned to dispensary duties

BOOK REVIEW

Thora ic Surg cal Manage m t by *J R B l b* M S. F R C S Con l Surg t th L d Ch t H p tal Lat R S O t th Brompt H p t l L do d *J R B. G ant* M B M R C. P (Ed) A t t nt Phy cia Ed burgh N rth m H sp tal d R yal V ctor d c d H p tal Lat R S O. t th Brompto H p tal L ndon F reword by S r *Cl m t Pri Thomas* K C. V O F R C S Sur- g on t We tm d th B ompt H p tal L d Con lt g Surgeon, K g Edw d VII S m M dhur t 196 pag ll rated Th W lliam & W lk C B lt mo e Md p bl h 1953 P c $3 50

Sir Clerrent Price Thomas in the foreword to this book states It will without doubt prove to be a great boon to those about to embark on thoracic surgery This reviewer is in complete agree- rrent. The authors have emphasized in their preface that the book is intended for those beginning residency training in thoracic surgery and for general surgeons who are occasionally calle upon to care for thoracic surgical patients To each of th groups this little volume should prove most helpful It is dev almost exclusively to the preoperative evaluation of thoracic gical patients and postoperative care of patients who have gone thoracic operations Much of the material is presen outline form thus facilitating ready reference The pa physiology associated with certain thoracic disorders is sufficiently to enable one unfamiliar with the field to u the nature of the various problems with which they are on to deal The pre- and post-operative care of most of mon thoracic di orders is covered and the methods re in general conform quite closely to accepted practice in try This book can be recommended for medical studen and residents particularly those who have an interes surgery In addition members of the nursing staff nursing care for thoracic surgical patients would p ianty with the contents of this volume

—*Capt C F Stor*

A STANDING TABLE[1]

ARTHUR D SALMON

THE medical staff at this hospital frequently has need for a standing table in the management of disabled patients Such a table is used to help severely disabled patients stand for a long time, or to assist less disabled patients to stand prior to the use of braces, parallel bars, crutches, and other functional devices The best type of a standing table is one that is light in weight, capable of supporting the patient in a good functional position, reasonably protective of all segments, and easily managed by a single operator

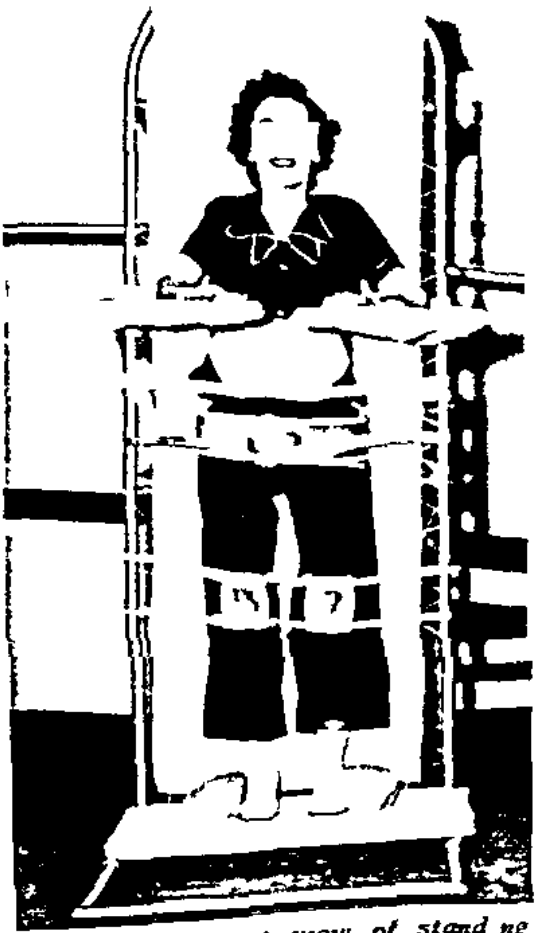


Figure 1 Front view of standing table with arm board attachment.

(1) Brooke Army Hospital Fort Sam Houston, Tex.

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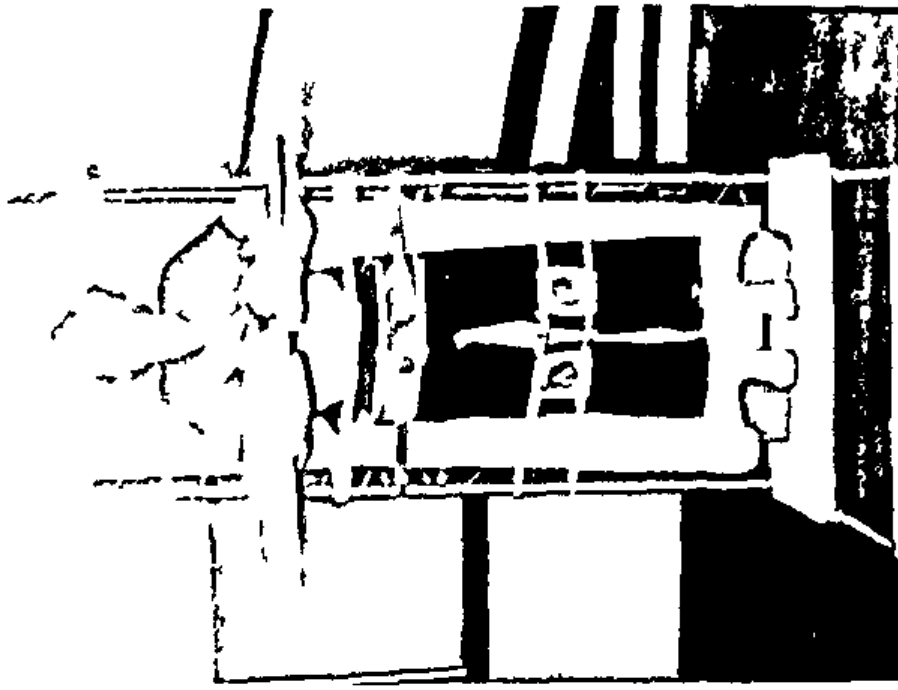


Figure 3. F w / the ad d t he ith de ht p attern e



Figure 4. Side ew of N hoe the rocker leg nd the / ly d ice

THE TABLE

a table (fig 1), made of 1 inch, galvanized, thin walled
, has been designed at this hospital The table can be
forward on its rocker legs with very little effort (fig 2)
apable of holding the patient in an erect position, but as a
precaution a bar is dropped to the floor while the bed is
ed to prevent it from falling back into a horizontal posi
A platform made of ¾ inch plywood, on which the patient
is located at the foot of the table Leather restrainers
rovided for support at the knees, pelvis, and abdomen
table swinging attachments may be added to the sides
or support of the arms If the patient is kept standing for a
ime, a desk top arrangement, made with 3/8 inch plywood
e placed over the arm supports so that the patient is more
rtable and the forearms and hands can be used if they are
le of function (fig 3)

National Birth Rate Rising

HE national birth total continued to rise during the first
3 months of 1953 aft etting a new annual record of
3,889,000 registered registered births in 1952, ac
ing to the Public Heal e of the Department of Health,
cation and Welfare uring the first quarter of 195
running about 29,000 he same period last year, an
ease of 3 percent Th irths for the January March
od is at an annual esti f 25 live births per 1,000
ulation, and is slightly tle birth rate for the
3 months of 1952

BOOK REVIEW

The Principles of Neurological Surgery by Loyal D [illegible] M S M D Ph. D [illegible] (Ill.) Professor of Surgery and Chairman of the Department of Neurological Surgery Northwestern University Medical School Chicago Ill 4th ed 5 x 8 p g 354 ill str t o 186 figures and 5 pl t 4 in c lor & F b g Philadelphia P p bl sh 1953 P c $8 50

[illegible] a general textbook and guide in the scope and prin[illegible] *rosurgery this reasonably priced book fulfills its* [illegible] medical student and general practitioner are given [illegible] *rd readable and easily assimilated text which is* [illegible] r [illegible] udy or reference For the specialist it is a pleasant, [illegible] review of his field

[illegible] tion on spinal cord injury simplifies the complex prob- [illegible] this condition and clearly shows the results of the au[illegible] t experience It could profitably be read and followed [illegible] one caring for these unfortunate patients Craniocerebral [illegible] herniated intervertebral disks tumors infections and [illegible] al l ions of the cranial nerves psychosurgery vascular [illegible] s and the management of anomalies of the nervous system [illegible] ll *well presented Peripheral nerve lesions are adequately* [illegible] ned with the exception perhaps of the advocation of the [illegible] nerve grafts These I believe have been abandoned by [illegible] eurosurgeons except for cauda equina or lesions of the [illegible] cranial nerve Likewise the author s experience with [illegible] ectomy for causalgic states is somewhat unusual The [illegible] re[illegible] of this procedure are usually good His indications for [illegible] ano[illegible] end results of other pain relieving procedures are clearly [illegible] and[illegible] rately expressed

This [illegible] an up to-date fourth edition of a book accepted by man[illegible] as a se[illegible] ible guide and textbook of neurological surgery

—Lt Comdr F B Clare MC USN

OPPORTUNITIES FOR PROFESSIONAL TRAINING IN CLASS I ARMY HOPITALS

ROBERT M HARDAWAY III *Lieutenant Colonel MC USA (1)*

EVERY physician should be a student and every hospital should be a teaching hospital whether or not it conducts formal intern or residency training A teaching program benefits a hospital by stimulating its staff to read current literature, prepare material for formal conferences, and participate in discussions thereby keeping them abreast of new developments

In many class I hospitals the chiefs of services and sections are certified by various specialty boards Their equipment and other facilities meet the standards of a registered hospital and an abundance of certain types of clinical material is available These facilities for professional training should be used to the utmost In civilian medicine, many orthopedic residents receive their pediatric orthopedic training in a children s orthopedic hospital, their traumatic orthopedic training in another hospital, and their corrective orthopedic training in still another hospital Each hospital has something special to contribute Similiarly in the Army, the class I hospitals have an abundance of certain types of clinical material not available in the class II (teaching) hospitals

For instance, at this hospital during 1952 about 500 patients with acute abdominal pain were observed Of these 172 (including patients with acute appendicitis, perforated peptic ulcer, perforated carcinoma of the colon, strangulated hernia, intussusception, ruptured ectopic pregnancy, acute cholecystitis, ruptured ovarian cyst and perforated Meckel s diverticulum) were operated on A large number of acute traumatic conditions, including nearly 1,000 recent fractures, were treated Carcinomas of the gastrointestinal tract were treated by radical resection About 2,000 babies were born in the hospital, many with such congenital anomalies as indirect inguinal hernias, pyloric stenosis duplication of the ileum causing obstruction, and gastroschisis which were repaired Over 66 000 surgical outpatient treatments were given Many class I hospitals are designated as specialized treatment centers and receive special types of patient in addition to

(1) U S Army Hosp I F n d l l V

the regular admissions This hospital has 4 0 beds for general and orthopedic surgery and is also the regional hospital for such installations as Fort Myer, Va the Pentagon and other military installations which refer patients requiring major operations such as bowel resection gastric resection diaphragmatic hernia and pulmonary lobectomy

To take advantage of the material available a professional training program which consists of weekly teaching rounds and daily ward rounds has been in operation for 3 years at this hospital At the weekly surgical meeting a motion picture may be shown a conference on current surgical problems or on surgical basic science may be held the current literature may be reviewed preoperative and postoperative care may be discussed the material obtained by attendance at professional meetings elsewhere may be reported on or surgical complications and missed diagnoses may be reviewed A weekly radiologic conference in which the clinical history of the patient concerned is presented by the ward officer is conducted by the chief of the x-ray service Only interesting roentgenograms taken during the previous week are selected and these may be supplemented by others from the teaching file A biweekly clinical pathologic conference is held A case is prepared by the chief of the laboratory service and discussed by an appointed physician Each one attending makes a brief defense of his diagnosis At the biweekly obstetrical gynecologic conference current and common problems are discussed A weekly surgical pathologic conference is conducted by the chief of the laboratory service to show the gross and microscopic lesions of the surgical specimens removed during that week In addition to these conferences physicians have the opportunity to attend all autopsies medical boards and medical surgical treatment conferences conducted in the hospital

All physicians are also required to conduct an outpatient clinic in their specialty and treat the patient throughout his illness both as an outpatient and as an inpatient In this way an improved doctor patient relationship is established

A record of the type of conference the attendance and the subjects discussed is kept Conferences must be fast moving and interesting and must start and adjourn promptly They must be scheduled in advance and be well prepared to insure an interesting program All present should enter into the discussions Teaching and learning go hard in glove o one learns more than the teacher who must be a persistent student Attendance at nationally recognized professional meetings is necessary to keep up with the advances in medicine Teaching is not easy It requires a great expenditure of time and effort It is a state of mind which should be ever present It is done not only in a formal con

ference but also on routine ward rounds, at the operating table, and at night on the emergency case. There is no better opportunity for demonstrating surgical anatomy than at the operating table or for teaching postoperative care than immediately after the operation.

An integral part of any teaching program is the preparation of scientific papers and the accumulation of the required data. Because records kept in the registrar's office of an Army hospital are not adequate for this purpose, they must be kept by the professional service concerned. They should include such data as diagnosis, treatment, and follow up notes. Mimeographed forms which give adequate data can easily be prepared. An adequate follow up is extremely difficult but every effort should be made to achieve it. A resident should have at least one investigative project for ultimate publication underway.

Although the professional program is for the benefit of the permanent staff of the hospital, it has been useful during the past 3 years in teaching interns from Walter Reed Army Hospital who come to this hospital for a month of general surgery or two months of obstetrics and gynecology. The intern is on duty in the hospital every second night. He examines new patients, makes a diagnosis and, if necessary, contacts the specialist on call. He assists if the patient is operated on. In this way he learns to coordinate symptoms and physical findings with pathologic conditions.

This program has been approved by the Council on Medical Education and Hospitals of the American Medical Association for 1 year of training in general surgery *(2)*. One or 2 years of general surgery is now required as part of the training in such fields as orthopedic surgery, urology, neurosurgery, and plastic surgery. Although the program is not adequate for 3 or 4 years of surgical residency, it is admirably suited for giving a general background in surgery as prespecialty training. For this type of training, the resident should rotate through various surgical sections, emphasis being given to general surgery. He should *not*, however rotate through the service of his future specialty because he will get that training in the subsequent years of his residency *(3)*. Emphasis should be placed on general surgical principles, preoperative and postoperative care, wound healing, fluid balance and the more common problems in general surgery.

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(2) Approved programs in surgery (Editorial Section). J. A. M. A. 142: 1216-1222, Apr. 15, 1950.

(3) College of American Pathologists and American College of Surgeons: Pathology in hospitals. Bull. Am. Coll. Surg. 37: Suppl. 2, 1952.

SUMMARY

Whether or not interns and residents are a signed to a hospital a program of professional training should be organized for the good of the staff and the patients

BOOK REVIEW

Th 1952 Y r Book of D rmat logy d Syph l l gy (D ember 1951 Nov mbe 1952) ed t d by *Ma on B S l b g* M D Pr f or nd Ch rma D p me t f Dermat l gy d Syph l l gy New York U y Po t G d t M d cal Sch l D r tor of D mat l gy d Syph l l gy Sk d Ca c U t d U ty H p tal N w Y k U ty B ll vu Med l C d *R doll L. B* M D A oc t P o f or f Cl l De ma l gy nd Syph l l gy N w York U t y P t-G d t M d c l S hool A oc D c or Sk d Ca r U t d Att d g D mat l g N w York U ity H p t l 444 pag ll u t d Th Y Book P bl h r I Ch g ll p bl h 1953 P $6

This year book adheres to the plan of organization used in previous years but with rearrangement of the chapter headings and with the addition of a new subsection on endocrine therapy The introductory chapter is devoted entirely to the present status of ACTH cortisone and compound F in dermatologic management and gives a concise and comprehensive account of their indications contraindications and toxicity The remainder of the book consists of abstracts of world literature from December 1951 to November 1952 on dermatology and syphilology The articles are well selected and adequately abstracted and many are followed by favorable or unfavorable editorial comment There are references to the works of other writers on controversial subjects It is indexed both by subject and author and each abstract bears a footnote reference giving the date and the journal in which the original article was published

I am sure that every dermatologist in the armed services will want this book for his personal library It contains sufficient material of general medical interest to render it useful to the internist and general practitioner as well

—*Col R M Williams MC USA*

OVARIAN TERATOMA IN A CHILD

BENJAMIN MAJOR *Captain, USAF (MC) (1)*

R E DAVIS *Captain, USAF (MC) (1)*

OVARIAN tumors in infants and children are relatively rare (2) Teratoma of the ovary occurs even less frequently in this group (3) Benson and Fulton (4), in a series of cases, reported that 31 percent of ovarian tumors in infants and children were teratomas and Costin and Kennedy (2) reported an incidence of 45 percent

In the differentiation of dermoid cysts from teratomas, most authorities now agree that elements from all 3 germ layers may be found in both types of tumors (2 5) It is preferable to regard all of these tumors as teratomas and classify them as solid or cystic, the latter being commonly known as dermoid cysts About one third of the solid teratomas undergo malignant growth (6), whereas only 3 percent of the cystic teratomas become malignant (2). Very few infants and children with malignant ovarian teratomas have been reported and in these, as in adults, the prognosis was poor (6 7)

The diagnosis of ovarian tumors in the prechildbearing age group is usually made from symptoms of torsion or rupture, or from an increase in abdominal deformity pressure symptoms, or endocrine disturbances The diagnosis is often made by abdominal roentgenograms which also aid in differentiating teratomas from the other ovarian tumors The differential diagnosis of ovarian tumors in this young age group includes appendiceal abscess and hemato- or pyo-metrocolpos Our patient was a 2 year old child who was admitted to the hospital with the diagnosis of acute appendicitis

---

(1) U S Air Force Hospital Sampson Air Force Base N Y

(2) Costin M. E J and Kennedy R L Ovarian tumors in infant and in children Am J Dis Child 76 127-153 Aug 1948.

(3) Novak, E Gynecological and Obstetrical Pathology 2d edition W B Saunders Co Philadelphia Pa 1947

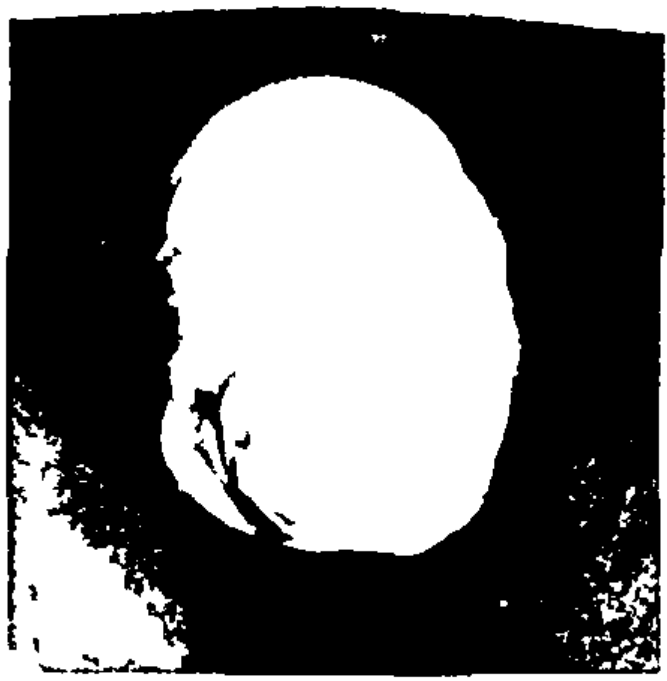
(4) Benson C D and Fulton H. E Teratoma of ovary in a child J Michigan Med Soc 49- 932 934 Aug 1950

(5) Weekly C. P G Ovarian teratomatous cyst occurring in childhood Surg Gynec & Obst 56 697-695 Mar 1933

(6) Lisa J R Hunter, W J Wimpfheimer S and Gusberg J D Malignant ovarian teratoma in infant 2 days and fetus Am J Surg 81 453 459 Apr 1951

(7) Feldman H J and Lisa J R Malignant teratoma of ovary in adolescence Am J Obst & Gynec 61 215-216, J 1951

tion of hydrocelectomy stated that he enclosed the scrotum within a gauze and adhesive bandage applied tightly so as to draw the scrotum upwards and obliterate operative space



Figur 1 Ela t c ba dage pp l d to crot m f ll wi g hyd oc l ctomy

The elastic bandage technic following hydrocc original with me but I believe that any surgeon impressed with the decreased postoperative sw scrotum Once he learns the correct technic in the plication of the bandage he will routinely use it

DENTAL HANDPIECE REPAIR AND CARE

ROBERT HOBSON Major DC USA (1)

A RECENT inspection of dental handpieces in the repair shop of the St Louis (Mo) Medical Depot indicates that poor care is given them by the users A survey of 87 straight handpieces, returned as defective, revealed that 22 needed only adjusting In one, a pulley had been removed and it appeared that the handpiece had never been used Twenty three percent of them could have been corrected at the using agency Of 211 contra angle handpieces turned in as defective, 63 percent were rusted and clogged with pumice Forty three percent of all handpieces inspected gave evidence of either maladjustment or neglect

The cost of repairing each straight or contra angle handpiece is about $5 00 At present the repair shop s production average is 500 repairs a month at a total cost of about $2,500 At this rate, 4? percent or $1,000 could have been saved by proper care in the dental clinic The short time required for this care will more than be repaid by the smoothness and accuracy of operation of the instrument and a saving of $12,000 every year in repair costs

Care of the contra angle handpiece Open the oil hole near the latch of the handpiece with a pipe cleaner Run the hand piece forward in the fluid cleaner for 1 minute and then reverse it for 1 minute Wipe the excess liquid from the handpiece and run it in oil at least 15 seconds, both forward and backward This procedure should be carried out after every use of pumice, and is mandatory at the end of each 4 hours of use

Suggested care of the straight handpiece Remove sheath of the handpiece and wipe the spindle clean with a dry towel Use a pipe cleaner to oil the spindle in 3 places inside the spindle and the upper and lower thirds of the outside of the spindle Cleaning and oiling of the straight handpiece is mandatory at the end of each day s operation

The bearings of the straight handpiece can be adjusted by tightening the rotating spindle down into the sheath until it will

(1) As gd W It R ed Army H spit l Washingt n D C pr e tly t A med S M di l P ocur ment Ag ncy Brooklyn N Y

not turn then unscrewing it from a
room for a light lubricating oil V
have slightly different methods of acc

These procedures are followed by
their own offices to prolong the life
equipment As dentists in the Armed
careful in the handling of equipment
it were our own Our financial inv
the same as any one else It is
that financial investment and to
optimum of efficiency

BOOK REVIEW

F ct on l d Surg l A tomy of th H d by
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t H sp l for J t D At
L ba n H p l M d l D tor B th
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l p bl h 1953 P $10

Th is well written and carefully organi
more than fulfills the need for the infor
little in the volume is original but it re
useful facts scattered throughout the li
est anatomists of the functional and
land It is the first work to present
tion to modern surgery of the hand in
tail that is necessary for present-da
hand surgeons It is an indispen
Bunnell s classic Surgery of the

Many of the illustrations are of
clarify details of the text but with
plete anatomical atlas of the d
from the viewpoint of func

The book is not a
ful information for
hand function Th
organized so that
mation —*Col P l*

Heart and Circulation, Diagnosis and Treatment by Meyer *Solar* M D F A C C Chief in Cardiology and Senior Attending Physician Unity Hospital Consultant in Cardiology Rockaway Beach Hospital and Madison Park Hospital Associate Attending in Medicine and Cardiology Kings County Hospital Brooklyn N Y Assisted by *Jacob Melnick*, M D 357 pages illustrated Froben Press Inc New York N Y publishers 1953 Price $7 50

The contents of this volume consist of 2 sections one of 22 chapters on diseases of the heart, and one of 9 chapters on diseases of the cardiovascular system It is sparsely and poorly illustrated There is no bibliography but an occasional reference is made to an authority in the text without indicating where it might be found The index is inadequate

The purpose of the book is to present a complex subject in a simple brief manner, especially for the use of the general practitioner and the medical student Simplicity is desired in the complex field of medicine but I believe that if the student does not become thoroughly acquainted with the details of the heart and circulation while a medical student he will probably continue with only a meager knowledge of this important field the remainder of his life This book is not recommended to medical students as a useful text but may be helpful to students in other fields who desire a simple, brief outline of this subject.—*Col T W Mattingly MC USA*

Hypersplenism A Clinical Evaluation by *Cyrus C. Sturgis* M D Chairman of the Department of Internal Medicine Professor of Internal Medicine and Director of the Thomas Henry Simpson Memorial Institute for Medical Research University of Michigan The Beaumont Lecture Wayne County Medical Society January 21 1952 American Lecture Series Publication Number 175 A Monograph in American Lecture in Medicine 97 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $3 25

This monograph, based on material originally presented as the Beaumont Lecture of the Wayne County (Mich) Medical Society on 21 January 1952, contains a brief, concise review of the clinical aspects of hypersplenism The structure, circulation and physiology of the spleen are very briefly covered the mechanism of hypersplenism according to several theories is impartially discussed and the classification and diagnostic criteria are reviewed This is followed by a discussion of such clinical entities as hereditary spherocytosis acquired hemolytic anemia, idiopathic thrombocytopenia, Banti s syndrome splenic neutropenia acquired splenic panhematopenia and miscellaneous conditions in which hypersplenism may play a role An evaluation of the effect of ACTH and cortisone and of splenectomy is given with a summary of the indications and contraindications for the latter The volume is adequately indexed and contains a bibliography with 81 references to the literature

—*Col A A Biederman MC USA*

Problem i De tal Local Anesthe ia by *M d l A n,* D D S Former Or l Surge G p t H sp l F me O l Surg H pit l for Def rm t es nd Jo t D s s Co l a t A th t t Oc n Hill M mor l H p t l P t Pr d t Ki g Cou ty Dental Soci ty A tho Co d ct I fultr t on nd Gen r l Ane the ia In Dent try Ed tor Mod n De t try Thi vol me w prepared fr m orig nal mater l ompil d by Dr *M d l A* wh h w re d d ed d fr r h d th by *Hill d R N* D D S. 760 page Il t ted Dent l It m of Int r t P bl hi g Co l B ookly N Y publi her 1952

This book is an unusual and informal presentation of many of the problems encountered by the general practitioner of dentistry in the administration of local anesthetics The author has included his own wide experiences in anesthesia as well as those of many other practitioners The book covers all phases of local anesthesia including in its chapters such subjects as anesthetics vasoconstrictors needles and syringes sterilization and technics for injections of the maxilla and mandible Those having adverse experiences in obtaining adequate anesthesia for cavity preparation will find the subject well covered Complications failures and the use of the newer antibiotics with local anesthesia are discussed This volume is recommended to those who have had problems in obtaining desirable anesthesia and desire an answer based on the experiences of dentists who have had similar difficulties It is well organized and completely indexed for quick reference

—Col F H Richardson USAF (DC)

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THE SECOND ANNUAL

INTERIM MEETING

of the

AERO MEDICAL ASSOCIATION

BRUSSELS, BELGIUM

24–27 September 1953

All Scientific Sessions
University of Brussels
Medical School

General Chairman
Andre Allard M D
Melsbroeck Airport
Brussels

VOL IV SEPTEMBER 1953 NO 9

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FOREWORD

Th *U t d St t A m d F M d I J rn l* th m d m f d m t g forma ion of dm i tratı d p of l all m d l p on l f th *Dep* tm f *D f* Th A s t S *t ry* f D f e (H lth d M dı l) d h Surg G l f h e l n ll m d l ff c d l ff M d al S rvı Corp ff Nur Corp ff d ff c f the \ y C rp f h A med F t d th m d al ulta ts f th A my Na y nd A F t bm t m t pt f p bl t th *J rnal*

MELVIN A CASBERG M D
Ass ta t S t ry f D f (H lth a d M d al).

MAJOR GENERAL GEORGE E ARMSTRONG
Su g n G al U t d Stat s A my

REAR ADMIRAL I AMONT PUCH
S g G n al Un t d St t Navy

MAJOR GENERAL HARRY G ARMSTRONG
S g G al Un ted State A F c

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Monthly Message

The United States Armed Forces Medical Publication Agency which was established on 17 November 1949 is composed of an officer from each of the medical services of the three military departments one of whom is designated as Director of the Agency and Editor of its publications In order to maintain continuity and impartiality of functions, the position of Editor of the Armed Forces Medical Journal is rotated every two years among the military representatives assigned to the Agency, in the order of Navy, Army and Air Force

Colonel Wayne G Brandstadt MC USA was assigned as Editor of the Armed Forces Medical Journal on 1 July 1951, the first Army officer named to this position His ability as an editor and his knowledge of scientific writing greatly enhanced the value of this publication Under his skillful guidance and editorship during his tour of duty as Editor, which terminated on 30 June 1953 this publication was outstanding in the field of medical publications The articles published afforded much valuable medical information to everyone who read them In maintaining the high editorial standards of the Armed Forces Medical Journal Colonel Brandstadt s performance of duty was most commendable and reflects favorably upon himself, the medical services of the United States Army and the Department of Defense

Colonel Robert I Benford USAF (MC) was appointed D ... of the Agency and Editor of its publications on 1 July ... I am confident that under his able guidance and editorship Journal will continue to be outstanding in the field of med ... publications

Melvin A Casberg, M D
Assistant Secretary of Defer
(Health and Medical)

AGE AND RESISTANCE TO MILITARY STRESS[1]

NORMAN Q BRILL *M D*
GILBERT W BEEBE *Ph D*
REGINA L LOEWENSTEIN *A M*

THE world situation today necessitates continuing attention to the problem of military security Because manpower is perhaps the most important factor in national defense, great interest is properly focused on it. Traditionally the active military defense of a nation has been relegated to its younger men because of their greater ability to fight and to endure physical hardship Because of the experience in World War II, more than ever before it is recognized that emotional stamina is also important

When universal military training was proposed as one means of meeting our defense needs, there was concern about its possible effect on the mental health of the young men of the country From a strictly military standpoint, it became important to have precise information on how well young men stand up under the stress of military service If it were known that men 18 or 19 years of age were much more prone to an emotional breakdown than were men of 20 or 21, this fact might affect the decision as to the age limits on compulsory military service Reports of previous studies have seemingly contradictory conclusions It was found in studying World War I material that men under 21 broke down in combat in greater numbers than their proportion in the Army would warrant *(2)* This conclusion was based on the doubtful assumption that men who were sent into combat in World War I were of the same age distribution as those entering the Army except for the time required for them to be trained and moved overseas Hogben and Johnstone *(3)* analyzed the British World War II experience and found that the likelihood of breakdown increased with age Although the greatest percentage of

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(1) F m th D partm t f P ychiatry Ge tg W h gt Un ts ty School of M d n W f d Ov rh ls M D Pr fes or f P y hiatry wa th t spo s ble t g t

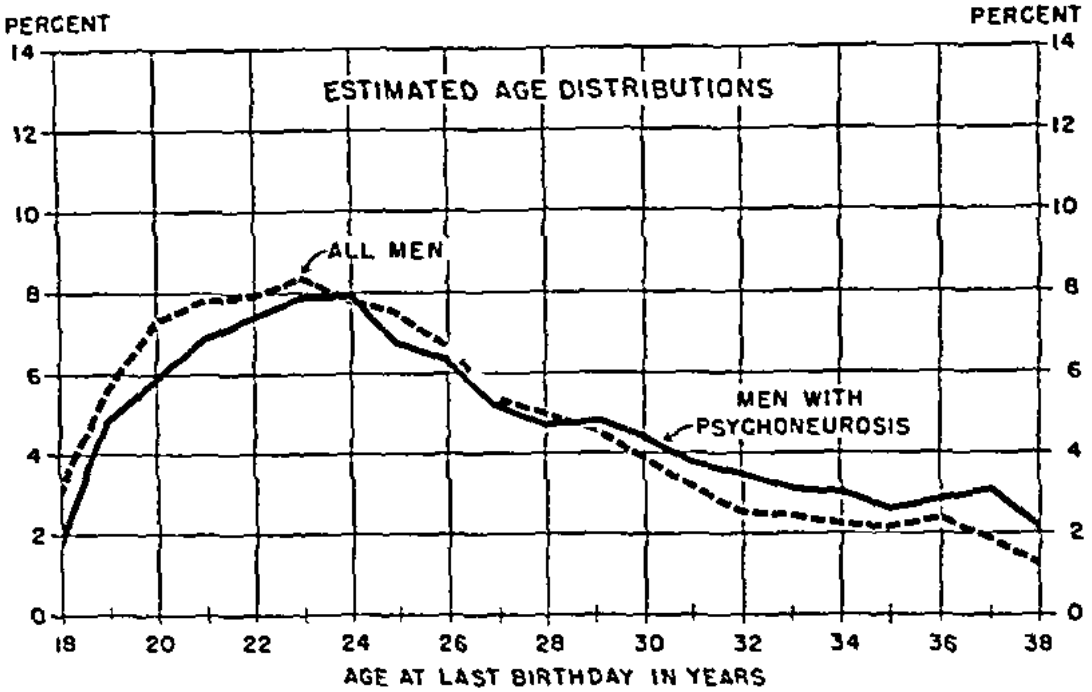
Th t dy was ppo ted by a tract w th th Veterans Admi strat o d c n st t te pa t f th co- perat pr gram of f llow p tud de l p d by th C mmitte V t rans M d cal Pr bl ms Natı nal Res ar h C un il nd the V terans Adm strat o w th th d of th Army nd N vy

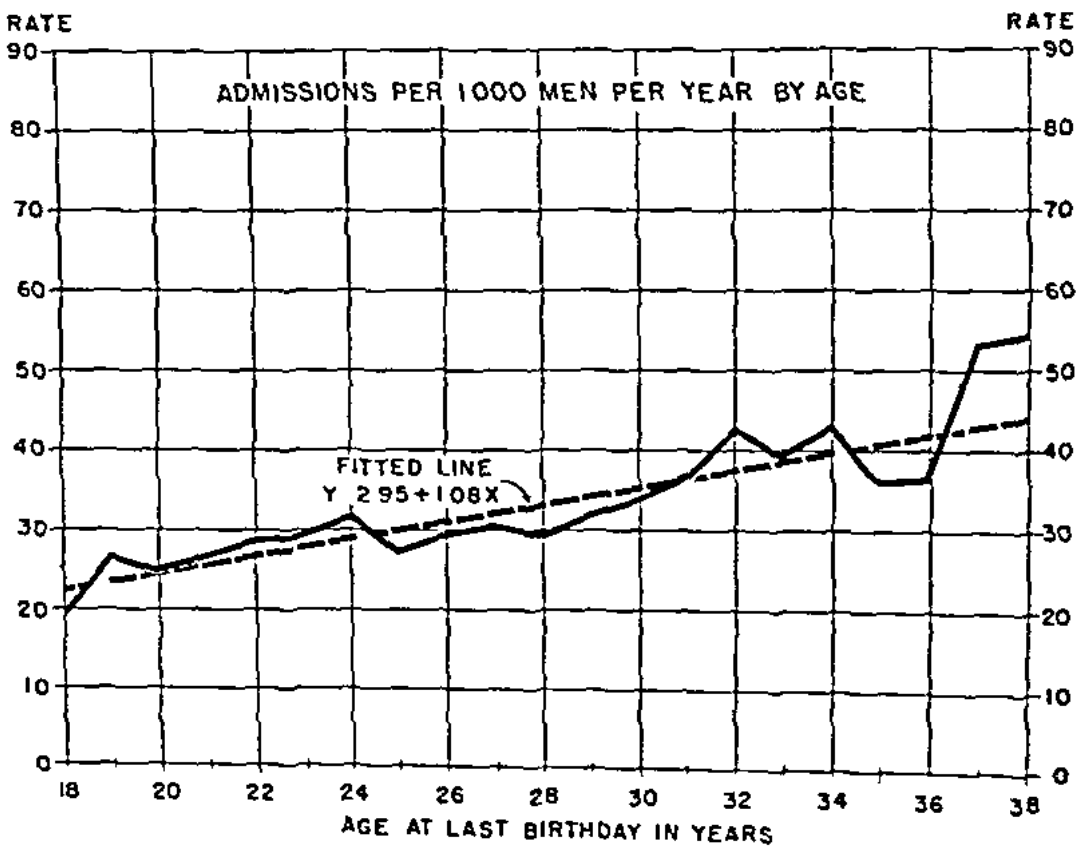
breakdowns occurred in the younger men the relative incidence of breakdown was far lower in this group than in the older age group

The incidence of psychoneurotic breakdown may be regarded as a result of stress and inherent resistance (or predisposition) This formulation is vague and in a statistical analysis of groups of cases it is not possible to specify stress or resistance for a given person Moreover we have not attempted to measure stre , but only to categorize it qualitatively for several military en vironments such as service in the zone of the interior active regimental combat duty, overseas service to the rear of active combat regiments and the various years of service (first second et cetera) It was possible to obtain adequate Army data on these items for 1944 To the extent that any such environment repre sents the same objective stress however defined for men of all ages found within it age variation in the incidence of psychoneurosis may be imputed to age variation in inherent resistance to such stress The foregoing assumption is not strictly true be cause the younger men usually receive the more stressful as signments within any military environment Therefore if the ap proach followed here were to show that younger men in a particu lar environment have a higher rate of breakdown we should hesitate to infer that they possess less resistance but because the data studied suggest that their rate of breakdown is usually lower we believe that younger men have greater resistance military stress and that our estimates of the differential are the conservative side

GROSS VARIATION IN AGE INCIDENCE OF PSYCHONEUROSIS

During the calendar year 1944 there were in the Army estimated 321 500 admissions for all psychiatric causes (4 distributed as follows (1) psychoneuroses 233 800 (2) psyc pathic personality 23 500 (3) psychoses, 22 900 (4) behavior disorders 20 300 (5) observation for nervous mental disease 13 600 and (6) mental deficiency 7 400 Of 233 800 admissions for psychoneuroses about 15 000 were o ficers 3 500 enlisted women and 18 500 nonwhite e men The investigation of age was confined to the white listed men whose admissions were estimated at 197 000 1944 (84 percent of all psychoneurotic and 61 percent of psychiatric admissions in that year) The average admis rate for psychoneurosis in white enlisted men in 1944 has be estimated at 31 admissions per 1 000 strength per year and constant on which virtually all rates presented in this depend





F gure 1 Inc dence of psycho eurosis by age white enl sted males U S Army 1944

The Surgeon General, U S Army, made available to us for a follow up study a sample of 7,100 punchcards representing admissions for psychoneurosis of white enlisted men in 1944 It is from these punchcards and a subsample of about 1,000 taken fr

them for intensive follow up study (b) that our estimates have been developed

The upper panel of figure 1 gives the estimated age distribution (6) of all white Army enlisted men in 1944 and the parallel age distribution for men with admissions for psychoneurosis In the lower panel appear the corresponding admission rates Ages beyond 38 years were omitted because of their small representation Being based on samples both the age distributions themselves and the admission rates are subject to sampling fluctuation For example the 95 percent confidence interval on the calculated admission rate of 29 for men aged 22 in 1944 is from 23 to 34 admissions per 1 000 strength per year For purposes of estimation we have fitted the straight line $Y = 2\ 95 + 1\ 08X$ by the method of least squares (where X is age at last birthday and Y the admission rate) to the estimated rates allowing each the proportionate weight obtained from the age distribution for the population of white enlisted men

TABLE 1 *Relative frequency by length of service 1944 and admissions per 1 000 male personnel by length of service U S Army white enlisted men*

Years of service	Percentage distribution		Rate
	Total strength	Admissions for psychoneurosis	
	(a)	(b)	
First	19 0	22 5	36
Second	42 5	33 0	24
Third	24 2	25 9	33
Fourth	11 6	13 2	35
Fifth or beyond	2 7	5 4	61
Total	100 0	100 0	31 (c)
Number of cases	5 816	6 973	—

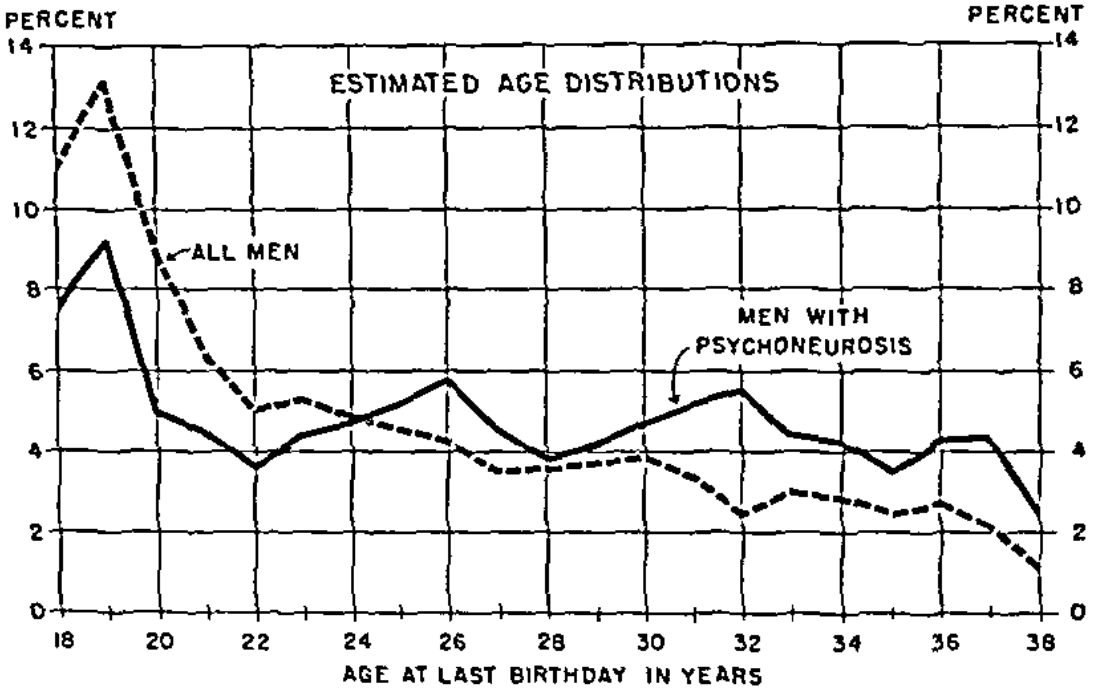
(b) Adjusted by (a) and multiplied by (c)
May of 1944

The increase in admission rate with advancing age is unmistakable and it will be noted that the rate for men aged 18 is the lowest of the entire set So many factors combine to produce this variation however that its full meaning is not obvious

AGE AND LENGTH OF SERVICE

To explore the possible meaning of the gross variation exhibited in figure 1 we first subdivided our samples by length

service in 1944 and estimated admission rates for psychoneurosis by both length of service and age Table 1 is a summary of these data by length of service only, regardless of age A disproportionately high rate characterizes the first year of service



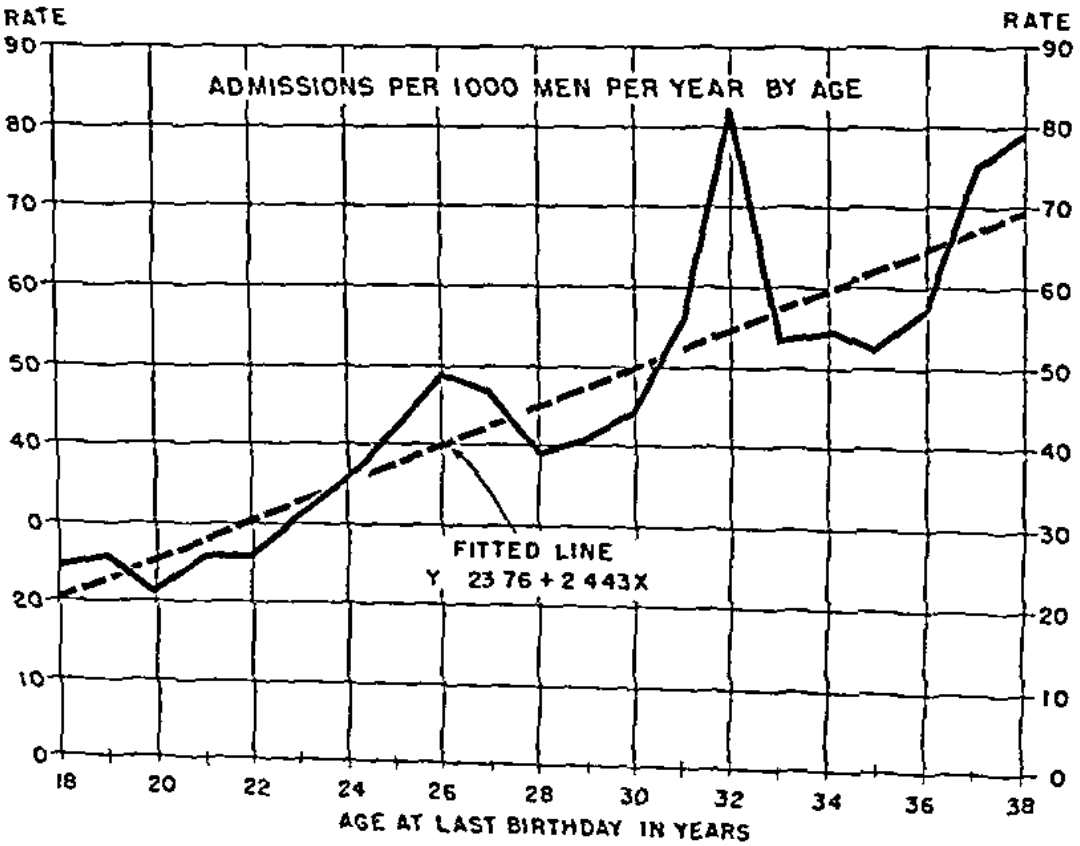


Figure 2 Incidence of psychoneuros s by age white enlisted males in fi st yea of service U S A my 1944

This is followed by a low rate in the second year and a gradually increasing rate thereafter On the basis of such material no evaluation of the relative importance of stress and resistance in the first year of service can be made but the findings of a follow up study of emotional breakdowns in World War II *(7)* confirmed the clinical impression that the men who broke down early usually were those with more obvious pre existing emotional difficulties (less inherent resistance)

The first year of service then is in part a screening process How the objective stress of the first year of Army life compares with that of subsequent years is a question to which this material gave no answer but because the rate of breakdown for the second year of service was much lower than that for the first year it would seem that the stress in the second year however great is insufficient to overcome the average resistance of men in the second year as compared with that in the first year of service By the third year stress had increased to such an extent whether by virtue of combat or by cumulative effect that this advantage was offset and the breakdown rate approximated that of the first year Very few men were exposed to combat stress in their first year of service and it seems probable that objective stress increased with lengthening service if only by virtue of an increasing probability of dangerous assignment Although it could be postulated that there is a cumulative effect of stress other than combat associated with lengthening service it could also be argued that many men grow accustomed to the noncombat stresses of military service and become better able to cope with them

TABLE 2 *Relationship between age and admission rate for psychoneurosis per 1 000 men per year by length of service in 1944*

Year of service	Admission rate per 1 000 men per year by age						
	All ages	18	19	20	21	22	23
1	36	25	25	20	26	26	30
2	24		27	22	23	20	22
3	33			68	47	46	31
4	35				32	37	37
5 or more	61					28	61

The age-specific data for each of the 5 length of service groups in 1944 is too great for presentation but that for the first year is of special interest and has been summarized in figure 2 Comparison with figure 1 shows that the variation as

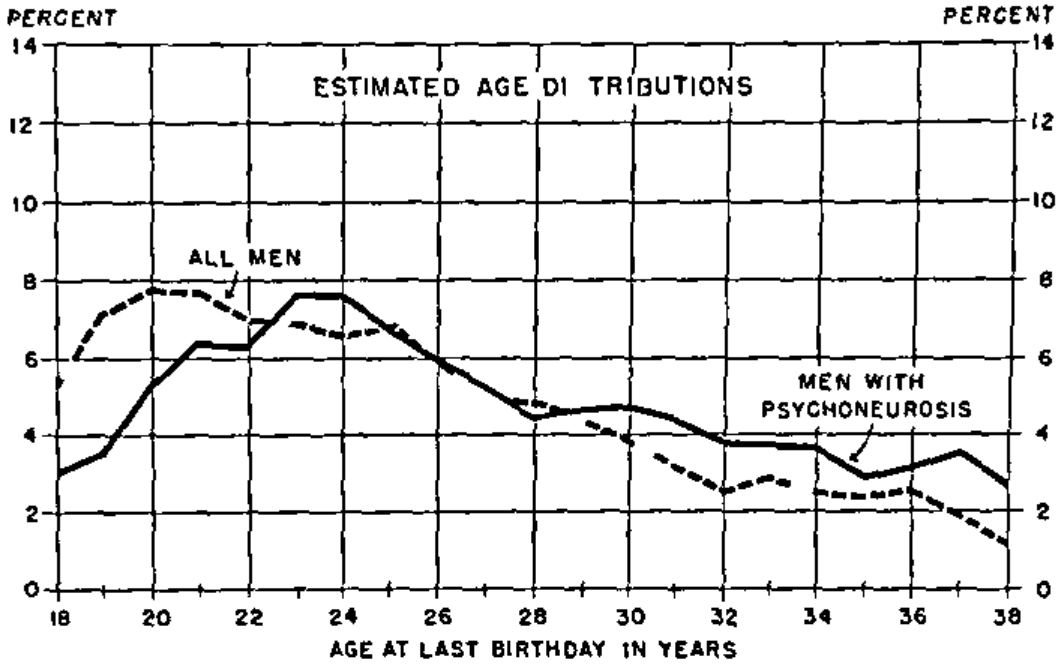
sociated with age is greater in the first year than in the subsequent years combined Older men break down 2 or 3 times as often as the younger men During the first year of service the admission rate increased by about 2 4 units for each year of age, in comparison with 1 1 for all years of service combined If the sampling of men of each age were unbiased and the experience of the first year represented the same objective stress for men of all ages, then the lower panel in figure 2 would provide a measure of resistance by age There is no reason to think that the older men would be exposed to greater objective stress than the younger men If anything, there would be a tendency to spare them in training schedules and assignments If the stress for each age were equated, either the same line as appears in the lower panel of figure 2 or one rising even more steeply would result It seems fair to conclude that there is at least as much age variation in rate of breakdown (and, conversely, in resistance) in the first year of service as is shown in figure 2 Younger men are better able to adjust to the requirements of the first year of Army life than are older men, by the criterion employed here

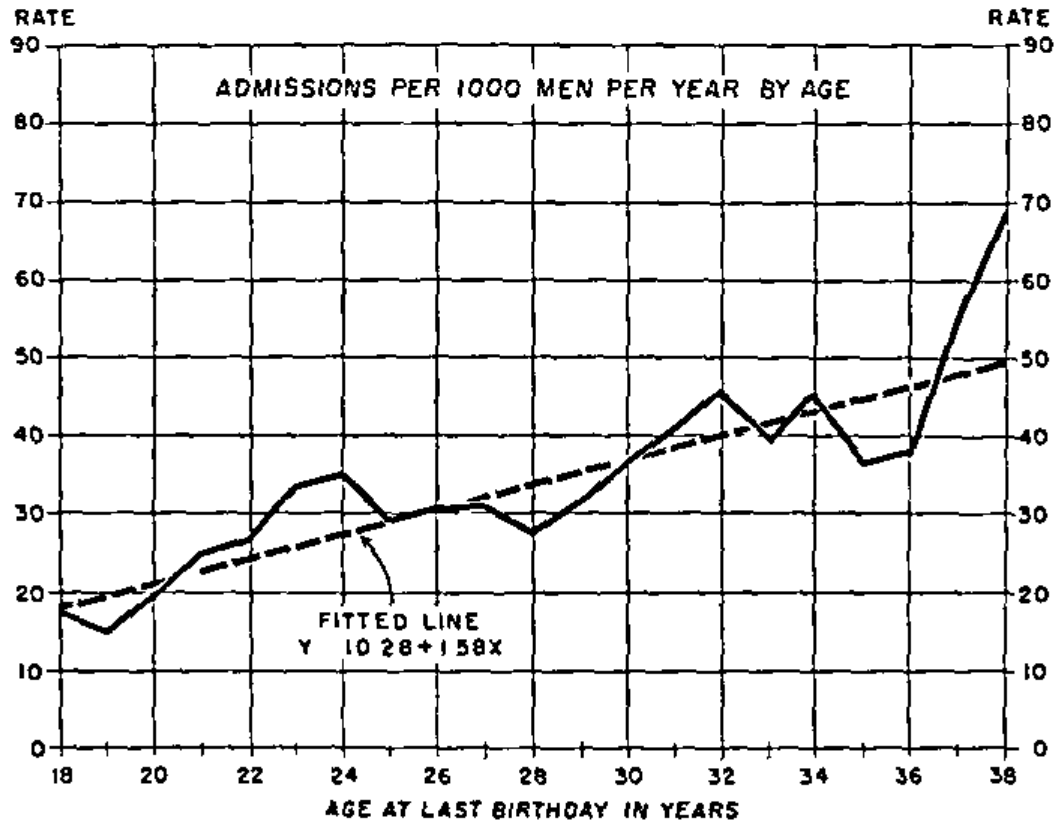
In the second year of service the effect of age in producing variation in the admission rate is minimal The screening has dipped more heavily into the older ages and although resistance has not been equalized there has been some tendency in this direction Starting in the third year, when the average level of stress is probably very different, the age differentials in rate of breakdown again become evident, but are strongly modified by the fact that by now the men at the younger ages have much more dangerous assignments (more being in combat) than the older men In consequence, the rates for the younger men tend to be above average beginning in the third year of service, as may be seen from table 2, which summarizes the age-specific rates for the younger ages This phenomenon turns out to be primarily an effect of using the younger men in combat, that is, the chance of a combat assignment after 2 or 3 years of service was especially high for the younger men Therefore, except perhaps for the first year, no constant relationship between stress and length of service can be assumed

AGE AND DIFFERENT MILITARY ENVIRONMENTS

To permit the selection of groups of men subjected to widely different stresses, all military service in 1944 was divided into 3 environments for white enlisted men in the Army (1) zone of the interior, (2) overseas, in the rear of active regimental combat, and (3) active regimental combat The second was the least homogeneous group and included troops in base areas as well as in the division rear areas and all Air Force personnel overseas, regardless of combat status The experience of a quiet theater

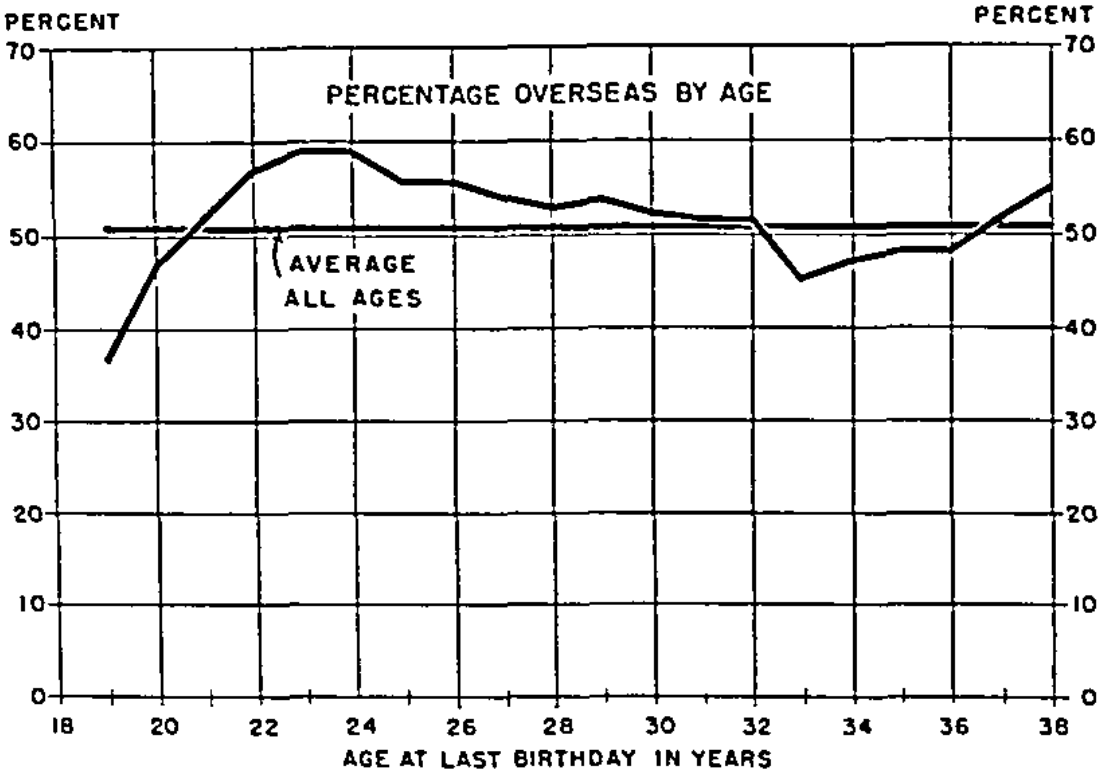
would have been preferable, but we were unable to develop an estimate for such a theater The age distributions and corresponding admission rates for men in the zone of the interior in

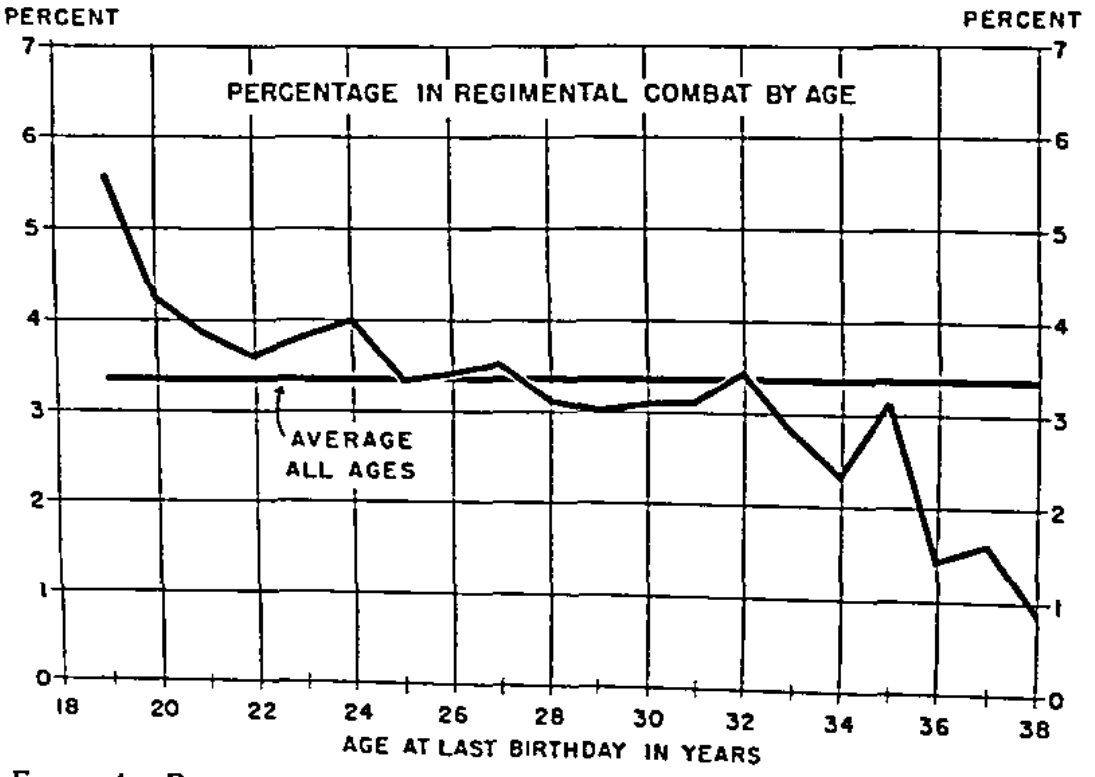




F gur 3 Inc d of p y hone by ag uh t l t d mal n th f the t or U S A my 1944

1944 appear in figure 3 The rate of increase is erratic but definitely upward and somewhat greater than that shown in figure 1 for the entire 1944 experience, regardless of military environment





F g 4 Percentag overseas and percentage in regimental combat by age U S A my ub te enl sted males 1944

The chance that a white enlisted man in the Army in 1944 might be overseas was on the average about 0 51 and in a regimental combat unit about 0 03 (8) and in both instances there was great variation with age but the patterns of variation differed greatly as may be seen in figure 4 This gives, for men of each age, the percent overseas (upper panel) and the per cent in a regimental combat unit (lower panel) The percent in combat was greatest for men of 19 The estimated age distribution for men in the regimental combat unit is the age distribution for 1 926 men with bullet wounds in 1944 who appeared on 6 rosters of Army battle casualties being used in the Veterans Administration National Research Council program of medical follow up studies No essential age difference existed between it and the one for men with shell fragment wounds In taking the age distribution of wounded men as the age distribution of men in combat regiments we assumed that the chance of wounding was the same for men of all ages in the regimental combat units This assumption could be wrong because even within the regimental area younger men tend to have the more dangerous jobs and are, therefore, wounded more often If so, our estimated age distribution for men in regimental combat units exaggerates the proportions at the younger ages and underestimates those at the older ages The age distribution of men who broke down in regimental combat represents 295 cases culled from the sample of 1 000 psychoneurotic admissions investigated intensively in the follow up study Men who broke down in rear areas or after leaving combat were excluded Because of the small size of the sample it is not very reliable at the older ages i e above 30

AGE AND RESISTANCE TO COMBAT STRESS

In figure 5 the estimated age distribution of men who were in regimental combat units in 1944 is compared with the distribution of those who broke down the admission rates are shown in the lower panel The average admission rate in regimental combat in 1944 was independently estimated at 285 admissions per 1 000 man years and as may be seen from the plotted points no significant variation with age was found There is no real evidence here of significant age variation in resistance to combat stress among men in regimental combat in 1944 It remains possible that such age variation was obviated by the many selective influences operating to determine which men participated in regimental combat On this view older men participating in regimental combat would tend to have a higher level of resistance than men of their age generally Certainly the figures plotted in figure 4 show that there was ample opportunity for such selection for the chance of combat assignment was much smaller for older men Also with an average rate of breakdown of 28 5 per

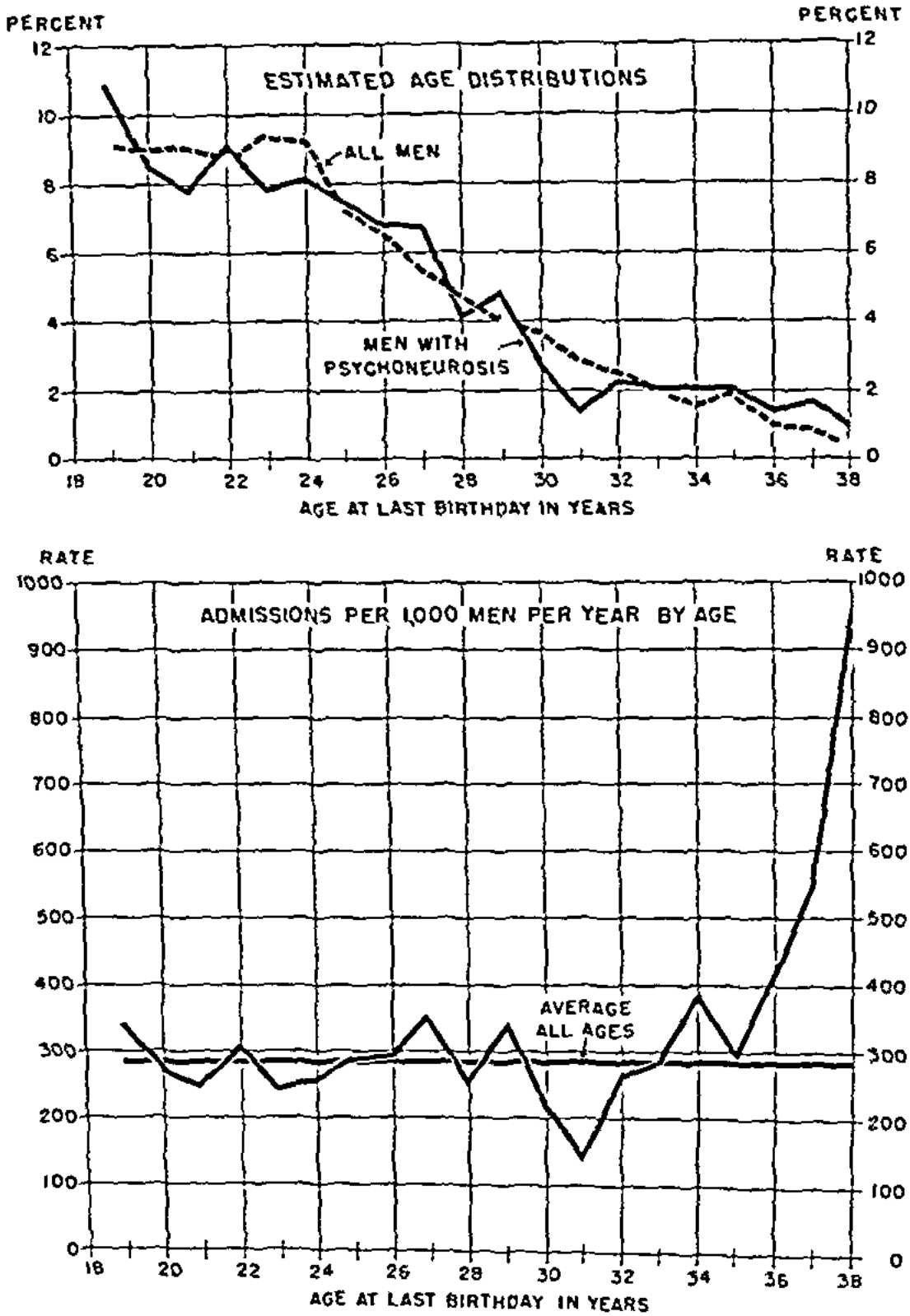
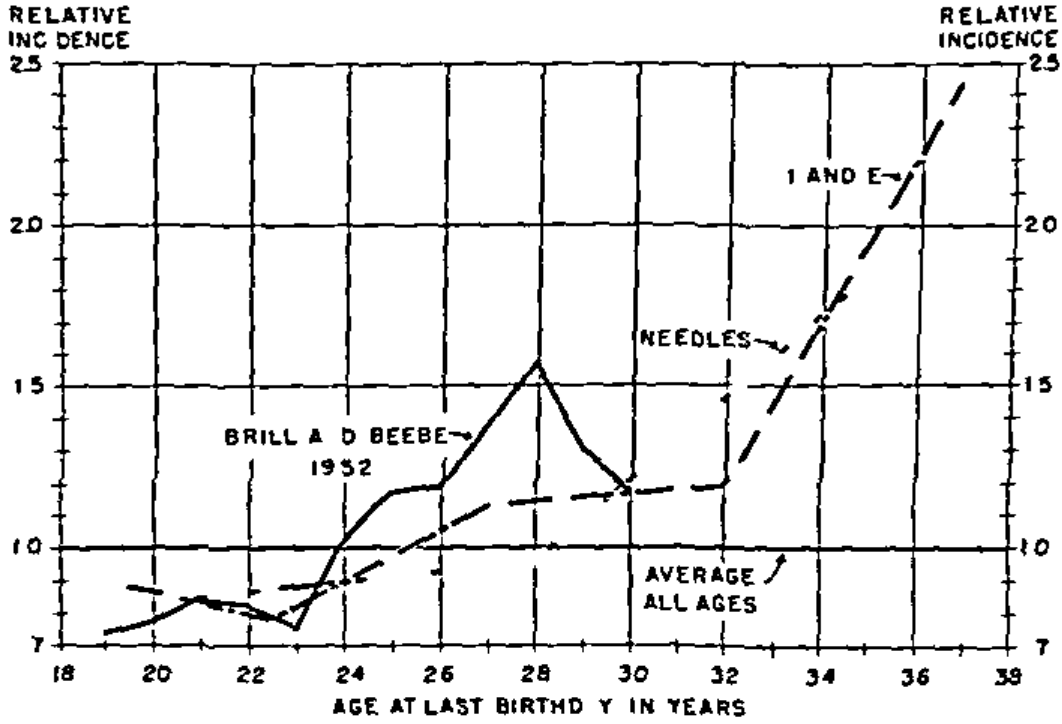


Figure 5 Incidence of psychoneurosis by age white enlisted males in regimental combat U S Army 1944

cent per year the stress of regimental combat may be of such magnitude as to exceed some point on the resistance scale at which younger men no longer have an advantage In any event, if, on the basis of these data alone, we cannot assert that younger

men manifest greater resistance than older men we can at least be reasonably sure that they have no less resistance If the selection of men for combat could be taken into account, it might be possible to show that younger men actually have more re sistance to combat stress



F gur 6 P eviou i mat of ciden of neurop y hiat lln by ag for me combat

Because the above conclusion is somewhat contrary to our own preliminary estimate *(10)* and to the observations of others *(11 12)* it requires further study \ e were led to re examine our own data because in another study *(13)* of a longitudinal character free of the problem of matching patients with an emotional break down with suitable controls we failed to find any suggestion that age played a role in the chance of breakdown among men in frontline high risk occupations Our preliminary estimate plotted in figure 6 represents 140 men in the follow up ample who broke down only once during their military service and were coded as having broken down in combat The criteria for the latter designation included a specification that, for ground combat it would apply to a breakdown in the regimental area but the regimental area was not carefully defined and breakdowns in air combat were also included In this restudy we recoded every patient according to rigid criteria for ground combat at the regi mental level In so doing we excluded fliers and some ground combat patients who were not in a strictly regimental combat area the men excluded were somewhat older than those retained

It was also desirable to add men who had broken down more than once during service These men were younger than others when they broke down in combat in 1944

Finally, we had, in addition to the patients allocated to psychiatrists for follow up, about half as many who had been studied on the basis of military records only These, plus additional patients found to meet the present criteria (bringing the total to 295 admissions), were reviewed The final result of this restudy appears in figure 5 The effect of the various changes is to destroy entirely the variation with age In figure 6 are shown 2 other series which suggest, as did our preliminary estimate, that resistance to combat stress is greater in younger men The Needles series *(11)* consisted of 100 patients with early combat neuroses from the European Theater of Operations evacuated from forward points to a neuropsychiatric center and 100 controls who had been evacuated to a neighboring general hospital with a medical or surgical condition sustained in combat The observed variation with age was not statistically significant From the published details it was not possible to determine whether combat was rigorously defined in such fashion as to ensure comparability of the controls and the psychiatric patients

INFORMATION AND EDUCATION

The Information and Education Section series *(12)* consisted of 400 men with psychiatric diagnoses studied in 4 clearing stations of the Fifth Army in December 1944 and April 1945 and 1,754 infantrymen in "letter" companies of the same divisions as controls in April 1945 When the 2 distributions were put together, the resulting age-specific ratios, shown in figure 6, rose quickly with the age, and there was no doubt of the statistical significance of the relationship There was also no doubt that the controls, chosen from letter companies, provided an excellent basis for estimating the age distribution of men in the regimental area, for they represented about 60 percent of the strength of the infantry regiment, but whether the controls accurately portrayed the age distribution of the entire division, from which the psychiatric admissions were evidently chosen, might be questioned An estimate of the age distribution of the entire division based on that of the men in letter companies would probably be too low but whether by an amount which would be sufficient to introduce a spurious relationship unfortunately remains unknown Our own preliminary series has the defects already mentioned and we no longer regard it as reliable for a regimental combat unit, but the Information and Education Section series may adequately represent the situation at the divisional level

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When the series from our restudy was compared in detail with that of the Information and Education Section an adequate agreement of the controls was found The difference lay in the fact that the Information and Education Section series of psychoneurotic patients was definitely older The agreement between the control series (men in letter companies and those wounded in action) provided indirect evidence that the wounded in action adequately reflect the age composition of regiments in ground combat

The available evidence is in conflict on the role of age in combat If the Information and Education Section series is accepted then the younger men have the greater resistance Our own data suggest that age plays no significant role The one conclusion which both series support is that resistance to breakdown in regimental combat is no less in the younger than in the older men actually participating in regimental combat

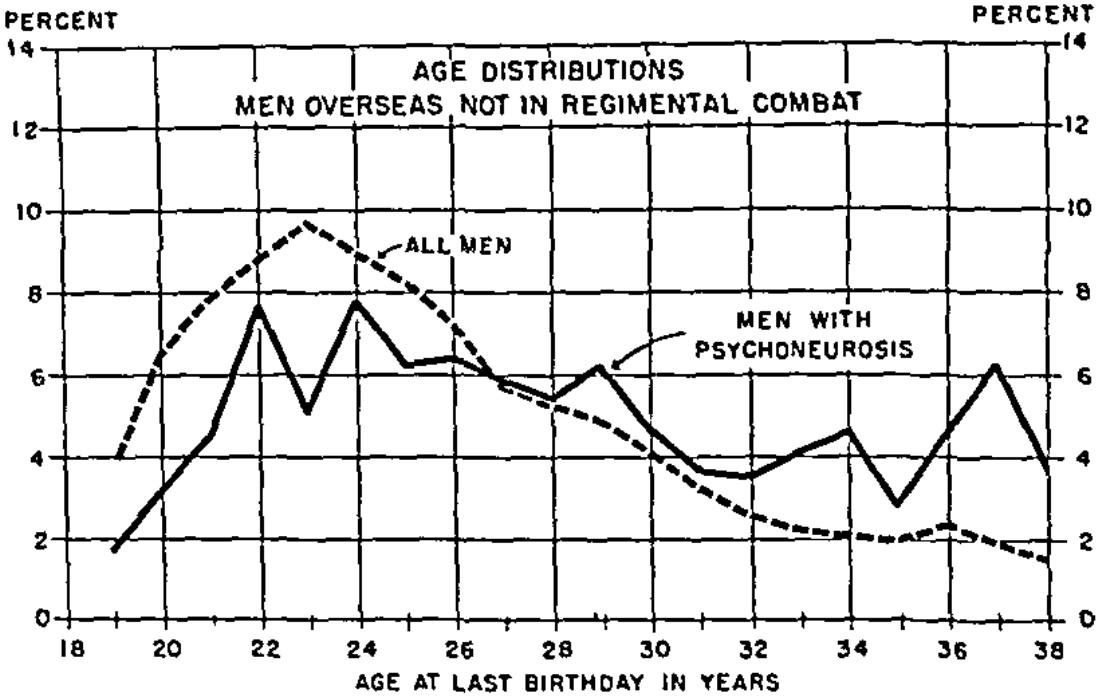
TABLE 3 *Relative Admissions for Psychoneurosis*

Environment	Man strength	Admissions for psychoneurosis	
		Number	Rate per 1,000 man-year
Regimental combat	214,600	61,150	285
Other theater	3,044,600	40,950	13
Total	3,259,200	102,100	31

RELATION OF ENVIRONMENT

From the standpoint of stress the environment in the rear of regimental combat was associated with a small amount of combat but represented predominantly noncombat experience The estimated subdivision of the total overseas experience in 1944 is shown in table 3 By comparison the rate for the quiet American Theater (largely Alaska but including bases in North Central and South America) was about 18 in 1944 *(4)* The total *neuropsychiatric admission rate for the European Theater of* Operations in 1943 has been estimated from another source *(14)* at 91 The calculated value of 13 used here is plainly of the right order of magnitude Figure 7 gives the resulting age distributions for the total strength and for men with admissions for psychoneurosis and the corresponding admission rates The lower panel also contains the admission rates for the entire overseas strength by age in and out of regimental combat Once the effect

of combat is removed, it is seen that the admission rate rises almost as sharply with age as was observed for men in the zone of the interior and in their first year of service



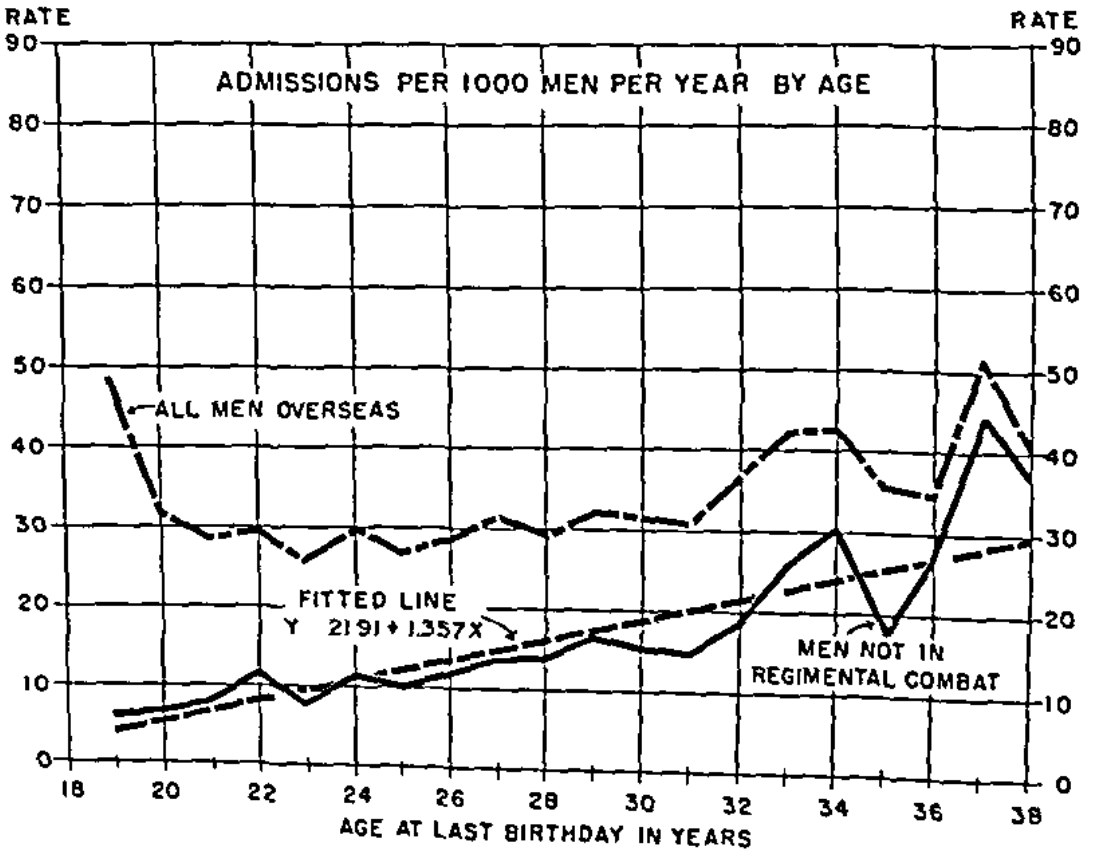


Figure 7 Incidence of psychoneuros s by age white enlisted males overseas U S Army 1944

AGE AND VARIATION IN RESISTANCE TO STRESS

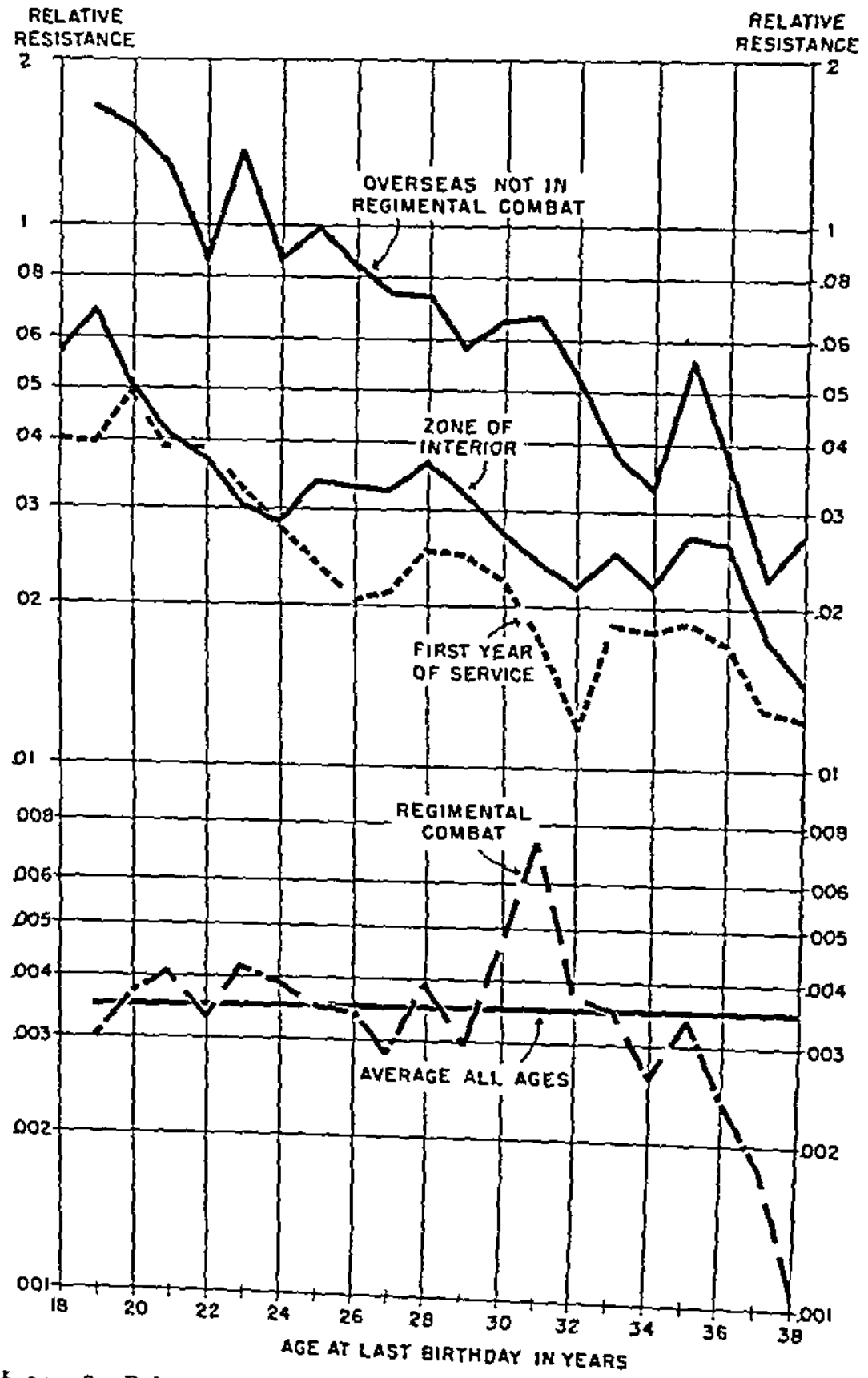
Thus far it was assumed that stress and resistance were inversely related and comparisons have been qualitative It would be advantageous to have a quantitative device for scaling the resistance of groups of men If we consider breakdown in a person to be precipitated by a stress of such intensity that it exceeds his intrinsic resistance then the proportion of men who break down (the admission rate) will rise as stress is increased or fall if a group with higher resistance is substituted Any environment will contain a manifold of stressful factors of different intensities, not one of fixed intensity just as the exposed persons will have more or less resistance to all manner of stressful phenomena It is therefore an oversimplification to describe the admission rate as the ratio of stress to resistance especially when the latter factors are undefined but if we do so the expression

$$\text{Admission rate} = \frac{\text{Stress}}{\text{Resistance}}$$

provides an arbitrary device for caling resistance whenever stress is fixed If there is a single environment in which 2 groups are equally exposed and manifest different rates their relative resistance may be characterized as proportional to the reciprocals of the admission rates By so doing however we are no closer to a definition of resistance All we have gained is a measure which permits various groups exposed to constant stress to be scaled according to their relative ability to withstand stress

When the above rough formulation is used as a descriptive device its value is impaired to the extent that stress cannot be taken as a constant for all age groups in the particular environment, but because any departure from this assumption will come about in these data only if older men experience less objective stress and because none of our estimates suggests that older men have greater resistance the assumption will at worst lead to an underestimation of the relative advantage enjoyed by younger men

In figure 8 we show the estimates of relative resistance by age within each of the military environments studied here In every environment except in regimental combat relative resistance falls off rapidly with age The decline is least overseas in the rear of regimental combat areas and greatest in the first year of service These environments represent the extremes of selection



F gu e 8 Relative esistance to breakdoun with psychoneurosis by age and by m l tary em onment white enl sted males U S Army 1944

We cannot expect age to compete with a psychiatric assessment in describing the resistance of a group of men but operating policy decisions in regard to age of men in military service must be made The data exhibited here show that resistance to military stress is greater in younger men in the several military environments with the possible exception of regimental combat where it is no less If the men of each age group could be scaled individually as to their resistance and plotted in the form of frequency distributions a series of overlapping distributions in which the relative proportion of men in the region of low resistance would rise steadily with increasing age could be expected Using the rate of breakdown as a guide to relative resistance very slight differences exist among the age groups in the region of high resistance but there is no doubt about the behavior of the distributions in the region of low stress

The greatest differences found among the age groups occur in the first year of service More of the older men are susceptible to the unfamiliar stresses of the military environment For any individual age the measure of resistance has a large sampling error but averages of several years are moderately stable

Age (years)	*Relative resistance*
18-19	040
20 24	036
25 29	023
30-38	017

Men of any age entering the second year of service may be regarded as a screened group rid of at least part of those who are most susceptible to military stress One effect of the screening is to lower the rate of breakdown in the second year for men of every age and to decrease the age differentials in admission rates As presented in figure 3 the zone of the interior material included most of the experience of the first year Although we were unable to derive a firm estimate of the zone of the interior experience for men in their second or subsequent year of service it is plain that there is relatively little variation by age in zone of the interior troops who have passed through the first year When all of the breakdowns occurring in the first year of service were taken out of the zone of the interior estimation the rates still increased with age but to a lesser extent than shown in figure 3 It would appear that the screening of the first year was sufficient to remove much of the age differential in resistance to zone of the interior types of stress

In the selection of men for overseas service there was surely a tendency to retain in the zone of the interior men with lower resistance so that on the average the overseas population must

have had more resistance Stress was greater overseas and age differentials in resistance were brought out among men in the rear of regiments in combat Forward of that point, however, men were even more highly selected and stress was so much greater that it apparently cut across the resistance scale at a point where there were no longer any age differentials of consequence, producing rates of breakdown which do not vary significantly by age

If all men of the same age, exposed in different environments, had the same resistance, the relative stress of the various environments could be graded Such is not the case because of the selection of personnel for various assignments and for continued service, but the general nature of such selection is known, and although it prevents us from estimating stress we may at least put lower bounds on the relative measures of it. Such selection is probably least at the youngest ages, say from 19 to 24 At the simplest level, the average rate is 13 for troops not in regimental combat areas and 285 for those in regimental combat areas, a ratio of about 1 22 The stress of regimental combat may be called 22 times that of overseas service in the rear of combat regiments if stress is measured by its capacity to produce psychiatric casualties, but because men of a given age serving in combat are presumed to have a higher level of resistance than men of that age serving to the rear, the calculated ratio is a lower limit If cognizance is taken of the fact that the men in and out of combat are probably most comparable at the youngest ages, from the fitted lines in the region of the ages from 19 to 24 it may be estimated that the stress of regimental combat may be on the order of 40 or more times that characteristic of rear areas overseas

INTERPRETATION

The military population is a screened population, and we know from World War II induction statistics that the rejection rate for mental disease increased notably with age For the period April 1942 to March 1943 the Selective Service monograph *(15)* on age gives the following estimated rejection rates

Age at examination (years)	*Rejections for mental disease (per 1 000)*
18 25	35
26-29	55
30-37	76
38 or more	92

These rates increase about as fast with advancing age as do the neuropsychiatric admission rates for men in their first year of

service Men of 18 and 19 had the lowest rejection rates *(15)* and this fact underlies the recommendation by the Selective Service System that men 18 and 19 years old should be liable for induction as they comprise the age group most physically fit The present study suggests that this age group is also the most emotionally fit to resist the various stresses of military service

At the upper end of the age range the information provided here is of less decisive value Our estimates of resistance suggest that the choice of an upper age limit is necessarily arbitrary In this region resistance is declining but up through age 38 at least there is no suggestion that any particular age is critical and age 38 must be regarded as an arbitrary dividing line

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(12) Th P d c f N ur p y hiatr B kd w C mba P pa d by R h Bra h I forma on nd Ed S Hq MTOUSA 27 A gust 1945 (114 M-9)
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PARTIAL RECONSTRUCTION OF THE EAR AND AUDITORY CANAL [1]

BERNARD N SODERBERG *Colonel MC USA* [2]
WILFRED T TUMBUSCH *Major MC USA* [2]
JAMES E HEMPHILL *Captain MC USA* [2]

AURICULAR defects sustained in the Armed Forces are numerous and frequently associated with other serious lesions Repairs are indicated for they not only improve the appearance but also improve the morale of the patient The timing of the surgery and length of the procedure are important considerations Frequently the reconstruction of the ear is accomplished prior to or during the interval period occurring in the sequential treatment of other parts of the body The objective is a repair that appears well at conversational distance



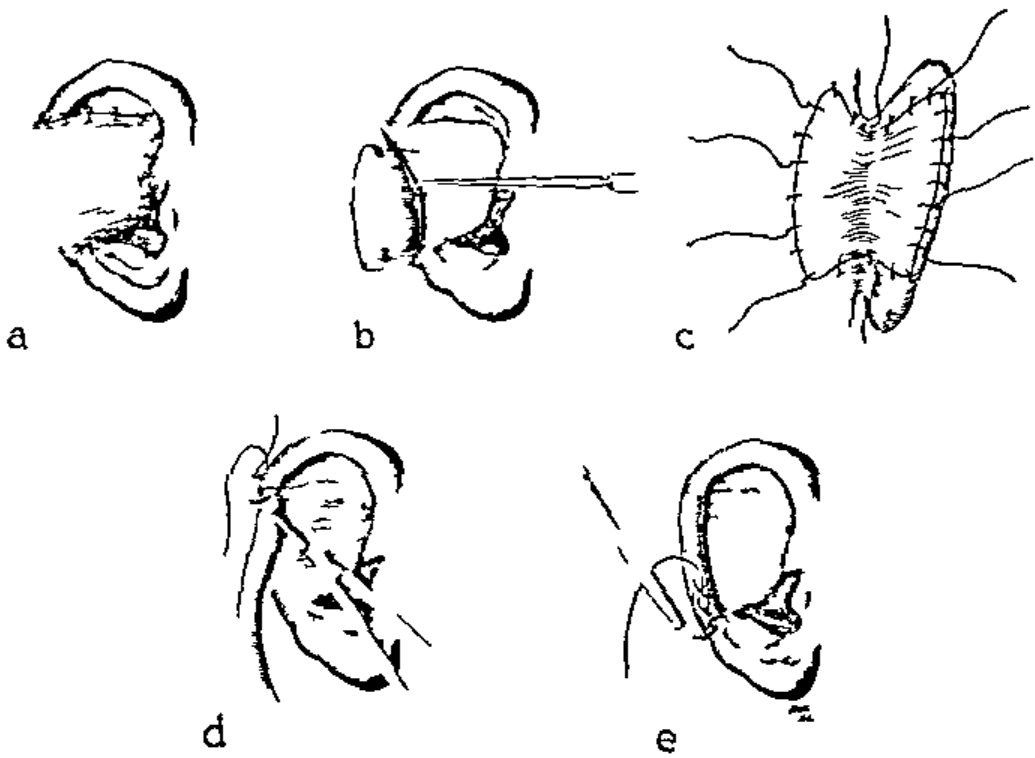
Figure 1 (A) *The residual defect after removal of an epithelioma.* (B) *The final appearance after plastic repair*

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(1) Presented before the Postgraduate Symposium of General and Military Medicine Brooke Army Hospital 10 December 1952

(2) Brooke Army Plastic Surgery Center Brooke Army Medical Center Fort Sam Houston Texas

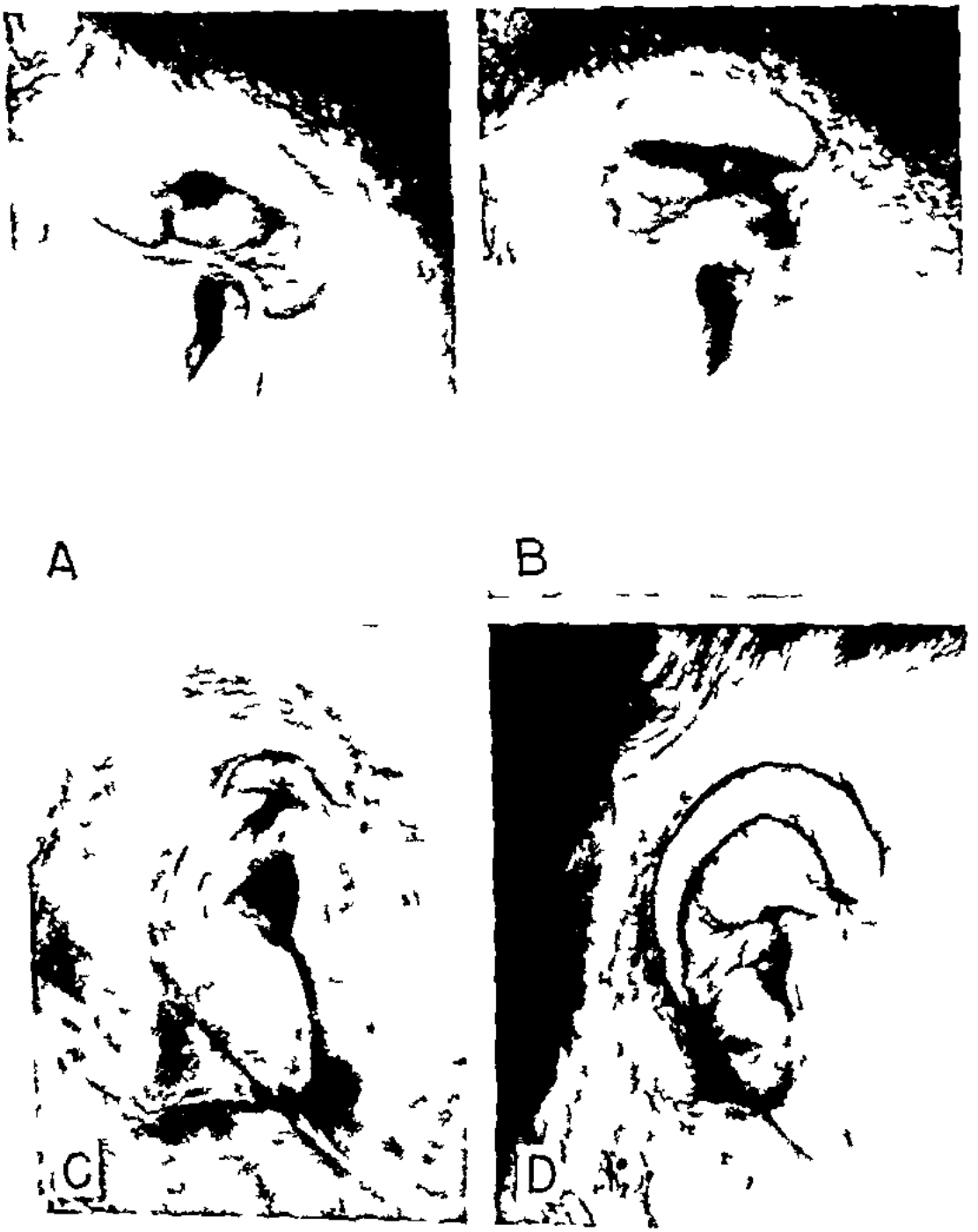
The surgically constructed ear should swing freely from the side of the head (fig 1) It is composed of an epithelial covering on both sides supported by a cartilaginous graft The first stage in reconstruction buries the remaining ear stump into the adjacent normal tissue The stump border freshened by excision is approximated to the edge of the scalp behind or above the ear This scalp skin formerly behind the ear now grown to the



F gur 2 (A) Impla tat n of a fragment t th po taur la k n. (B) I nt on of c t l g bene th th adhe t p t ular k n. (C) The on t ct d ear ha be n pa t d f om th h ad a d k gr ft ppl d for g f th w ea L g p pher l t a t d over a st nt d g (D) d (E) Small t be p d l t a pla t ompl t the p of the h l x

stump border forms the outer ear surface Three weeks later satisfactory union permits the second procedure At this time a piece of cartilage either autogenous or homologous is carved to the desired shape and inserted beneath the scalp flap A month is allowed for healing and the establishment of an adequate blood supply The third procedure provides the inner epithelial covering eparating the ear from the side of the head The scalp flap and subjacent adherent cartilage are carefully dissected leaving a thin layer of soft tissue attached to the undersurface of the cartilage The double raw surface presented is covered with a free skin graft taken from a nonhairy body area Sutures are peripherally placed and tied over a form-fitting pack (stent dressing) to insure apposition of the graft to the recipient site (fig 2 a b and c)

If the adjacent local skin is scarred, it is replaced with a three quarter thickness skin graft Reconstruction may then follow In figures 3A and 3B, repositioning of ear fragments and excision of cicatrix left a large denuded midsection This was skin grafted, completing the first stage of repair Figures 3C and 3D show what can be attained when adjacent donor material has



Figu e 3 (A) Ear in ub ch locat sk n has been replaced by cicat x with mal position of ea stump f agments (B) The sca has been removed and emain ing ear pa ts epositioned A skin graft extends about the auditory canal joining the uppe ea ca tilage and postauricula normal skin. (C) A skin graft completely encircl s a lobe f agment (D) The upper two-thirds has been completely reconstructed



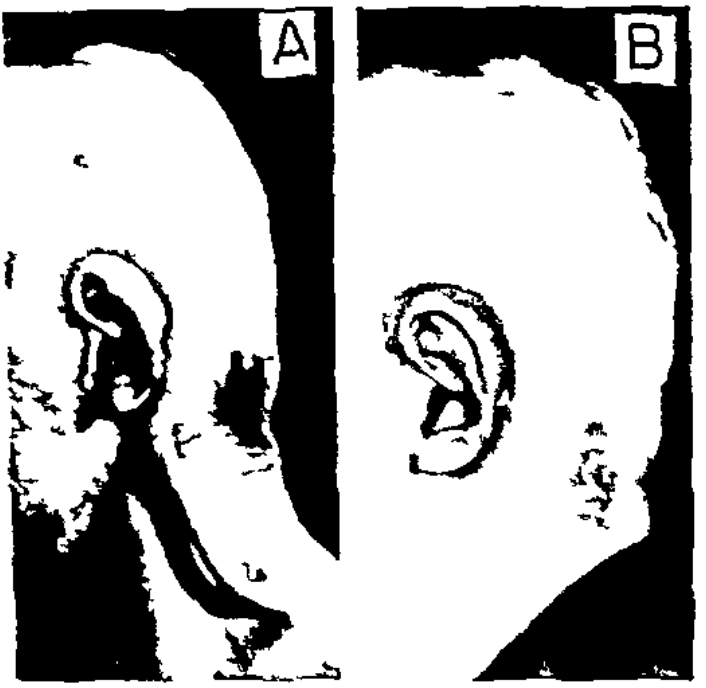
Figure 4 (A) Defect. (B) Thick skin graft (A plaster cast fixed the position.) (C) Final result.

been largely supplied by skin graft In this patient the first stage of reconstruction began with the insertion of a cartilage graft beneath the skin graft This procedure was followed by a skin graft applied to the medial surface of the embedded cartilage to free it from the side of the head The final stage added the



Figure 5 (A) Defect before of banded-carved cartilage (B) Final result.

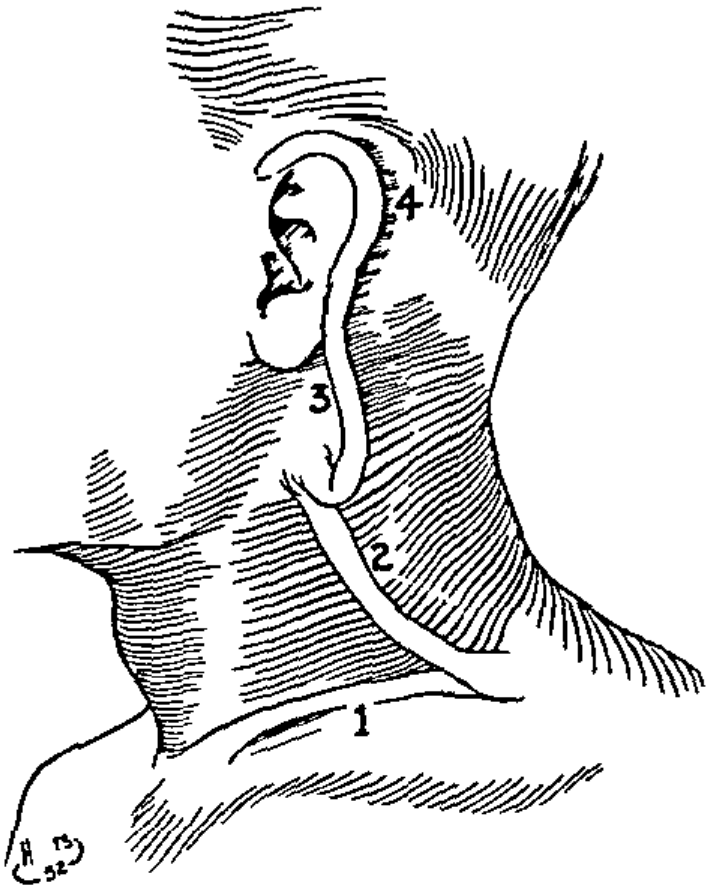
tube rim When donor sites in ear reconstruction must first be reconstructed by skin graft, longer time intervals must take place between subsequent surgical steps in order to permit the establishment of an adequate blood supply in each stage Figure 4 shows an unusual method used to supply soft tissue volume A tube skin graft in one stage was raised on the arm and immedi ately inserted into the recipient site The pedicle was sectioned and insertion completed 3 weeks after attachment



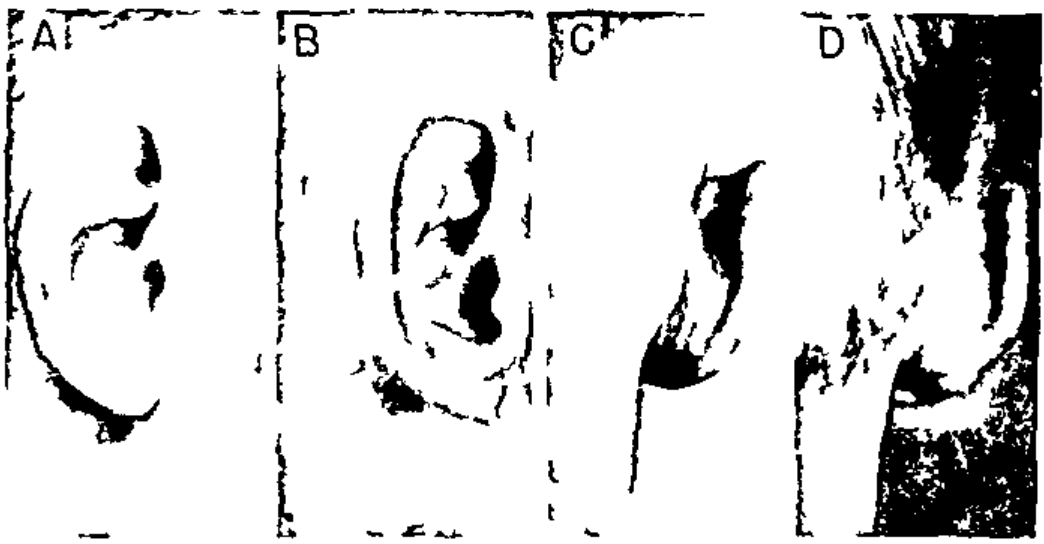
F gure 6 (A) The f st m gration of the tube ma terial used to econstruct the helix (B) F nal result afte thi d m grat on

Variations in technical procedure to obtain improvement in the appearance of the ear have largely involved the handling of the cartilage support material Prefabrication before implantation beneath the scalp flap has been accomplished by using cartilage chips packed in vitallium *(3)* or acrylic *(4)* molds These have been implanted in the abdominal wall until fibrous tissue united the small cartilaginous blocks Hand carving of the cartilage has been accomplished when larger pieces of cartilage were available The sculpturing method produces suitable ears (fig. 5) Prefabrication of cartilage combined with iliac bone refrigerated until time of use has been recently introduced *(5)* The method shows possibilities which may make its use valuable

Soft tissue transfers used to improve auriculocephalic angles consist of triangular flaps *shifted* from the mastoid region to the posterior surface of the ear (6) and implantations of the remaining ear tube into the postauricular sulcus after completion of other ear parts



F g 7 Tb mbe of m grat y t g s eq d
d p d on the l gth f the t b



F gu e 8 (A) and (C) how the m s g h l x (B) a d (D) how the res lt
a hi d by ad c g the p t cul kl

Ear rims, if desired, are produced by adding tissue to the periphery of the attached skin flap This is accomplished by using the tube skin grafts formed locally and transferred to the proper position (figs 2, D and E, 6 and 7) We now construct these in a transverse direction at the base of the neck (fig 7) The older method of forming them across the flexion creases of the neck leaves noticeable scars In men, the local donor site is covered adequately by clothing, in women the tube may be constructed

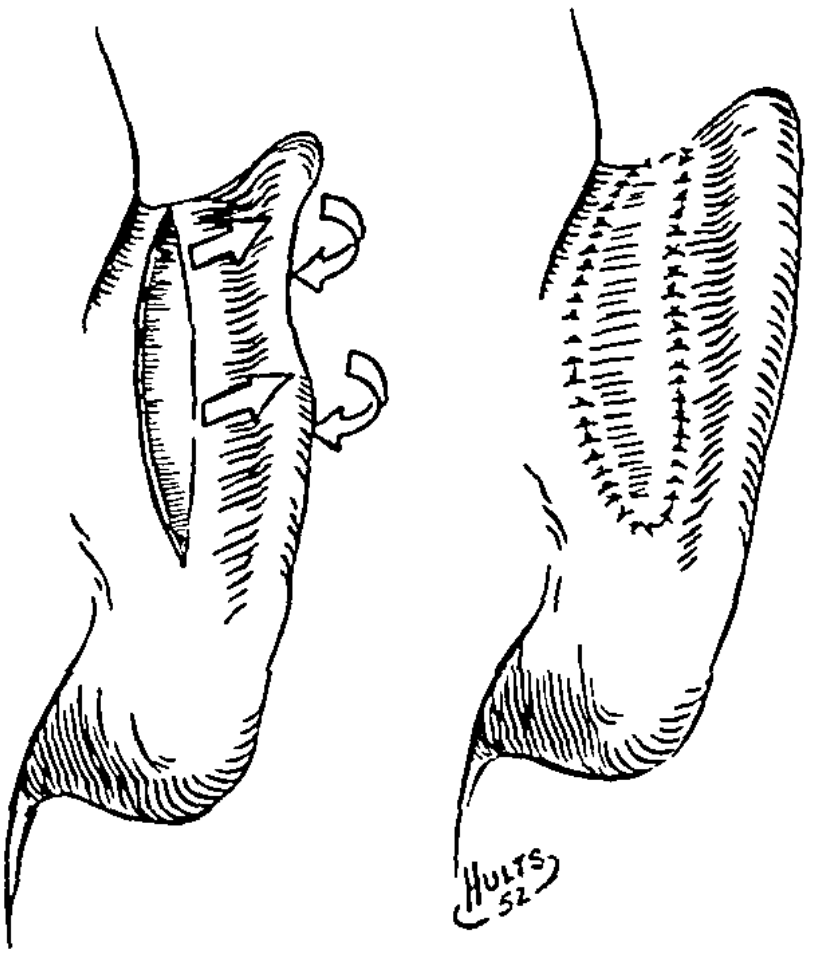
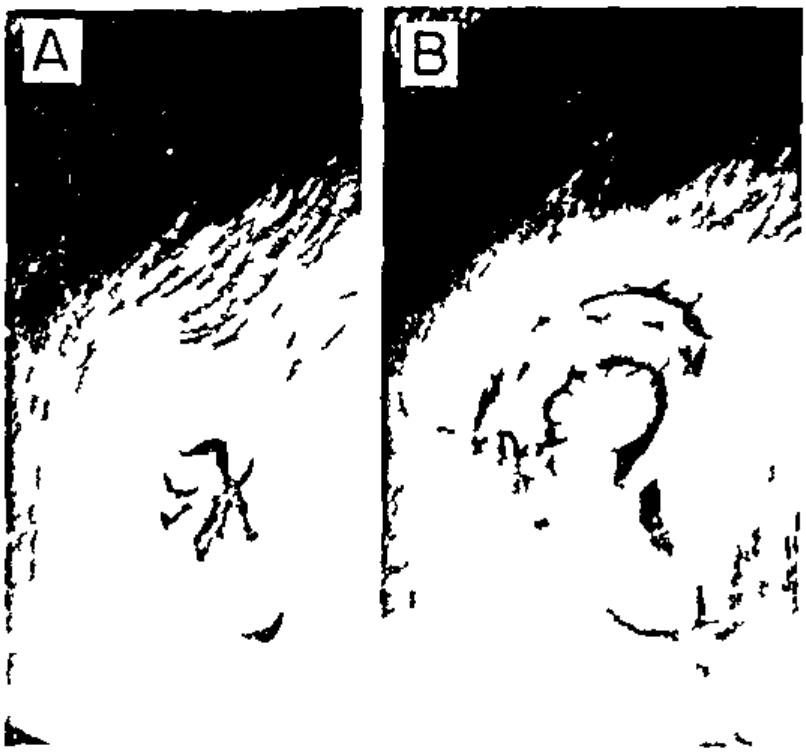


Figure 9 Diagram showing the procedure used to obtain the result shown in figure 8 The incision was made in the postauricular skin The distal part was carefully undermined until looseness allowed the lateral advancement indicated by the arrows A skin graft was placed in the denuded donor site

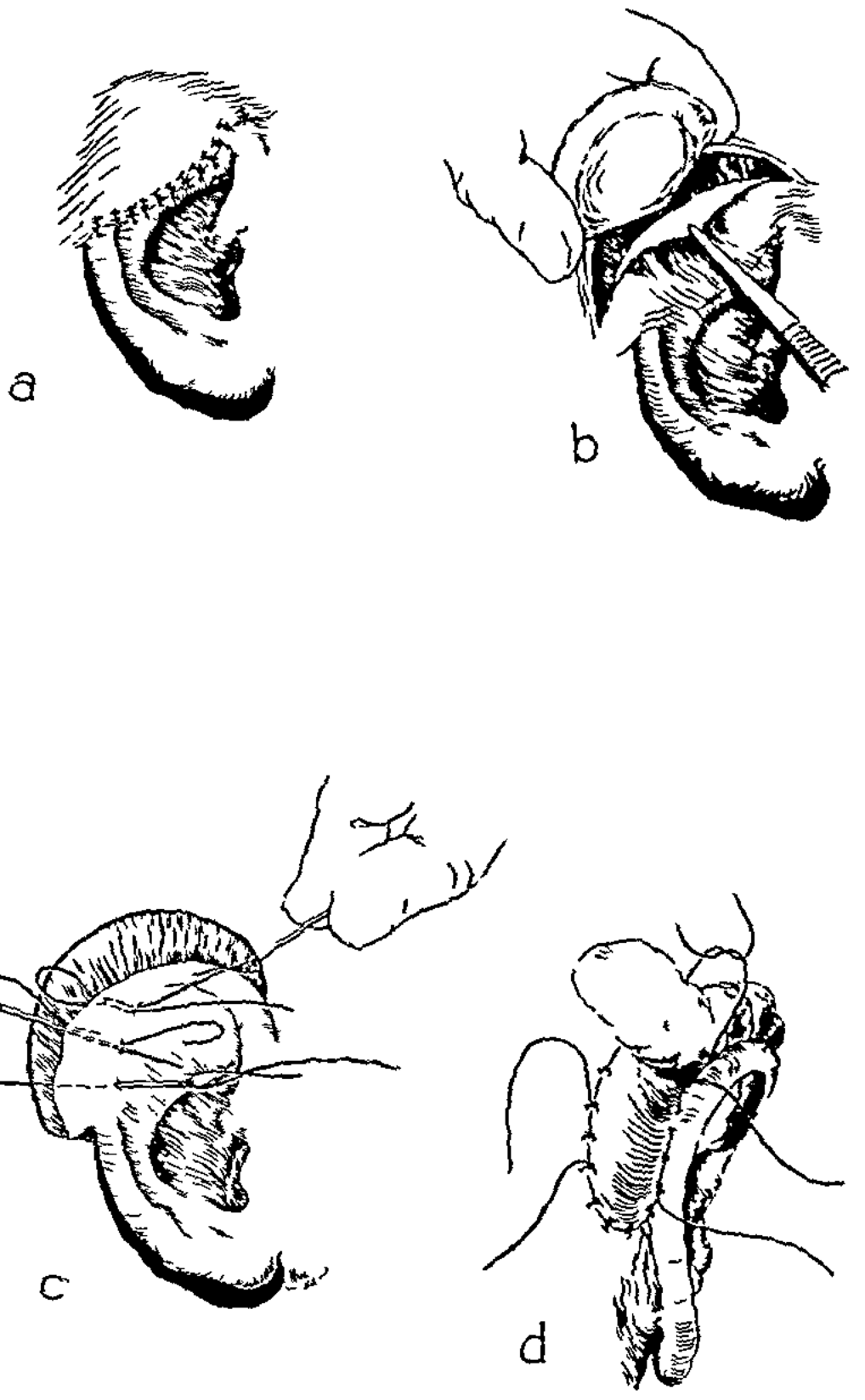
in the vertical position just anterior to the hairline of the neck We have used 2 other methods of construction for the helix that are more rapid than the tube pedicle and can be readily employed in certain defects The first of these is the advancement flap used when losses are confined to the helix, as in some burns (fig 8) The postauricular skin is advanced laterally, forming a helix roll on the outer aspect A skin graft covers the denuded site (fig 9) The rolled soft tissue construction will shrink in time

if supportive material is not incorporated Contour carved strips of cartilage as well as small portions of cartilage from a corresponding curvature of the auricular concha have been used *Attempts to incorporate tantalum failed because shrinkage* pressure of the skin against the metal continued until its exposure required its removal Another method of helix construction more rapid than the migrating tube pedicle uses the local scalp flap which is left long about the periphery of the flap This is rolled laterally and sutured as a tube The method has been worth while and saves time (figs 10 and 11)



F g 10 (A) D f t b f g l l p pbe l s ft t t m l t th bel m (B) R lt b fore m l of t t be

Preserved cadaver cartilage is used in many instances *(7 8) Calcified material is avoided for the foreign material is a hazard* Autogenous cartilage is preferred for a large or total reconstruction In our experience, the traumatized soft tissue of the reconstructed ear in which preserved cartilage has been used does not heal as well as when nonpreserved cartilage is used With this transplant exposed and infection present time will be saved in most cases by removing the cartilage at once Healing then will be rapid permitting an early definitive repair Antibiotic therapy has been used for infections with specific organisms Xiphisternal bovine cartilage has not been used *(9)*



F gure 11 Diagram shou ng *procedute used to obtain the esult shown in* f gure 10 (A) F₁ t stage (B) Implanting *the ca tilage* (C) *and* (D) Con st uct on *of the rolled im and cove age of denuded area by stent fixed* ski graft.

Associated destruction of the external auditory canal occasionally is present (fig 12) This is repaired by excising the obliterating cicatrix and reconstructing the epithelial lining A model of the canal size is made at the time of operation and a

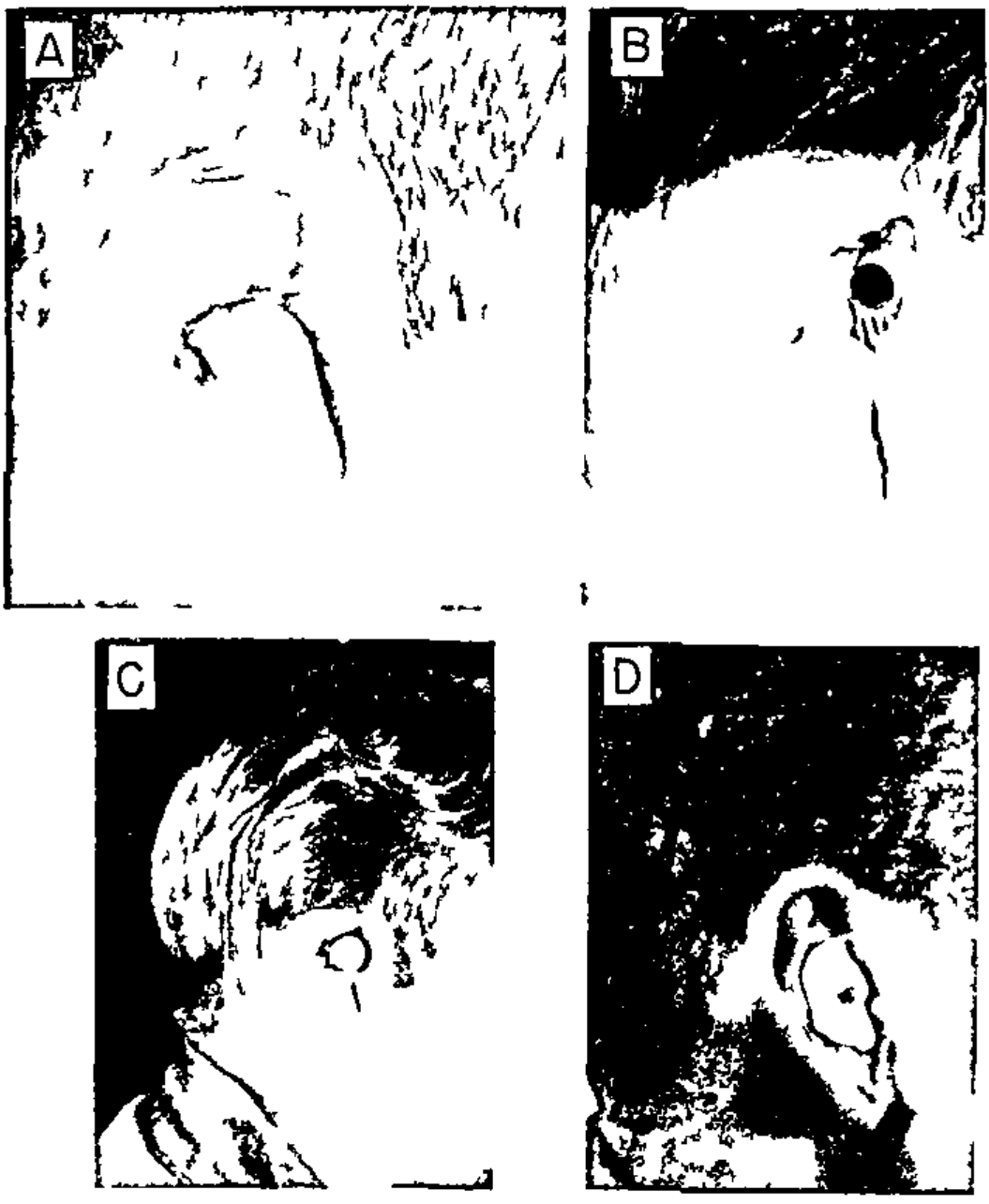


Fig 12 (A) Deformity before correction of the external auditory canal by inlay skin graft (B) The canal and immediately adjacent area completely covered by continuous sheet of skin. (C) and (D) Acrylic dilator in place in 2 patients

hollow acrylic dilator is constructed from this model (fig 13) The dilator is inserted into the newly lined canal immediately on the removal of the surgical stent A time lapse of even a few

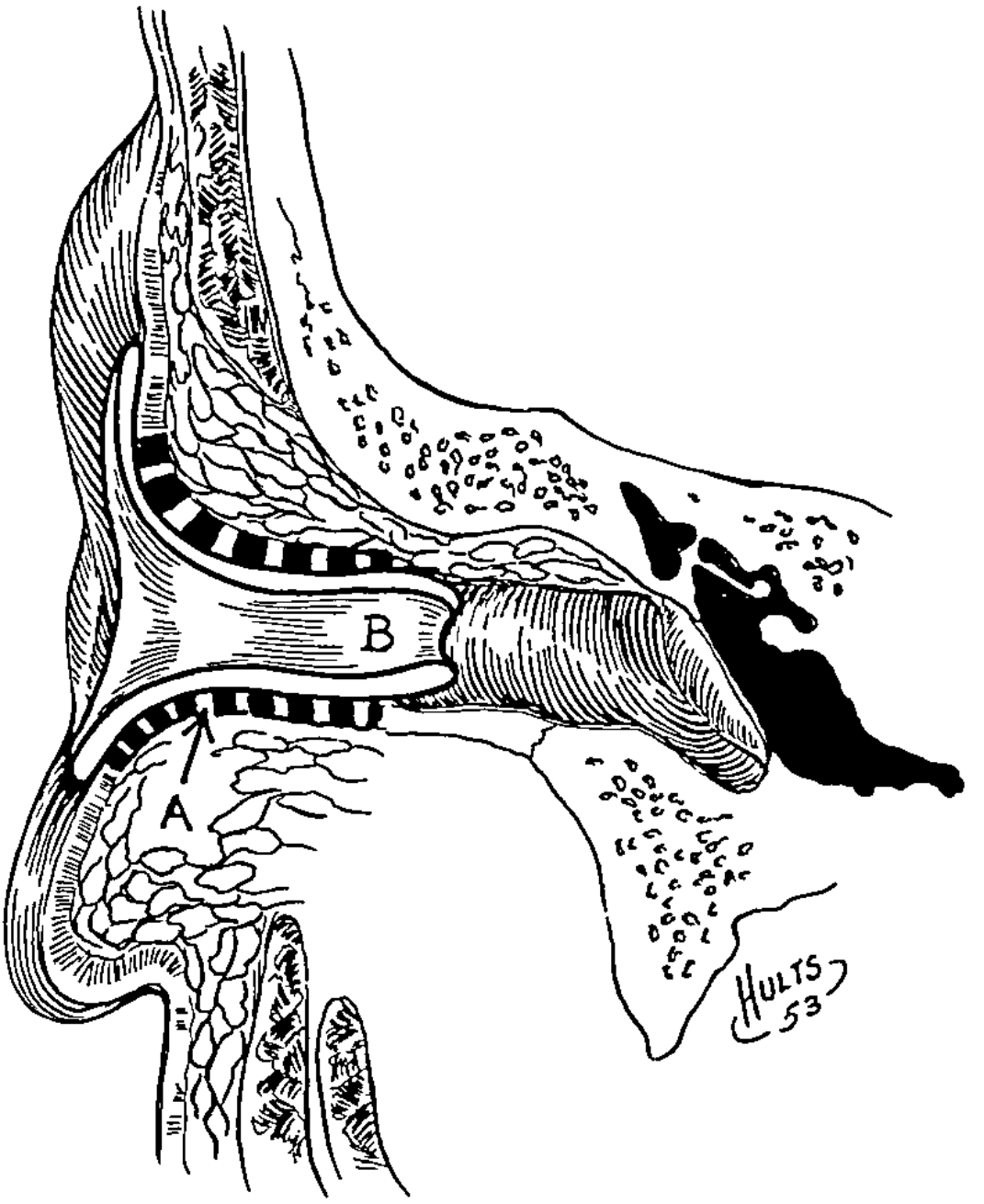


Fig re 13 C oss section show ng adbe ent skin graft forming new lining (A) The form f tting acryl c d stende (B) is hollow

hours between removal of the stent and insertion of the dilator may permit contraction that cannot be overcome without an addi tional operation The acrylic distender is kept in place until the contractile phase has passed This period may last from 3 to 6 months The principle of Z plasty has rarely been applicable (10)

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OFFICERS OF A M A SECTION ON MILITARY MEDICINE

Major General Harry G Armstrong Surgeon General U S Air Force was elected chairman of the Section on Military Medicine at the annual meeting of the A M A in New York in June 1953 Other officers elected were Dr I S Ravdin member of the Civilian Health and Medical Advisory Council Office of the Secretary of Defense and John Rhea Barton Professor of Surgery University of Pennsylvania School of Medicine vice chairman and Colonel Charles L Leedham MC, USA Chief of Education and Training Division Office of the Army Surgeon General secretary

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Military surgeons were forerunners of medical science Disease and obscure injuries were supposed to come from displeasure of gods and demons and were treated by magic Injuries of battle however were inflicted by human agents They were understandable and accessorated some crude knowledge of anatomy and physiology for they had to be treated by methods more rational than incantation

—*William Holland Wilme*

A STUDY OF PREMATURE INFANTS

ARTHUR G SMITH *Captain USAF (MC)*

OGDEN C BRUTON *Colonel MC USA*

ONE of the major challenges confronting the medical profession today is the reduction of fatalities attributable to premature births Deaths due to prematurity account for 30 percent of all deaths during the first year of life and for 46 percent of those in the first month [1] The reduction of these fatality rates must be preceded by accurate analyses and reporting of uniform data, including the many factors which lead to the birth of premature infants and contribute to their death Although the American Academy of Pediatrics[2] in 1935 defined a premature infant as "a live born infant who weighs 2,500 grams or less at birth (not at admission), regardless of the period of gestation," and recommended the reporting of premature infants in specific 500 gram weight groups, many authors have subsequently coined their own definitions As a result, studies which are otherwise accurate are difficult to interpret and compare with studies which abide by the recommended criteria One study[3] grouped stillbirths and live births together, another[4] categorized the premature infants in terms of pounds rather than grams, and still another[5] used 2 250 grams as the maximum weight for prematurity The present study was undertaken because it was thought that comparative studies of fatality and survival rates among our premature infants would assist us in evaluating our methods of care

CLINICAL MATERIAL

This study represents a review of the clinical records of those premature infants who were either born in or admitted to this hospital soon after birth during the 53 month period of March 1948 through July 1952 Of the total of 505, the records of 20 premature infants contained insufficient data for inclusion in the study, leaving 485 infants as the basis of this report The definition of prematurity used was that recommended by the American Academy of Pediatrics [2] hence, stillbirths were excluded and single and multiple births were grouped together In addition, births occurring inside and outside a hospital were grouped to-

From Walter Reed Army Hospital Washington D C

gether there being only 14 (3 percent) of the latter The fatalities reported excluded any which occurred subsequent to discharge from the hospital Although the socioeconomic background of these infants varied widely no attempt at classification of this factor was made

INCIDENCE OF PREMATURITY

Of a total of 5 651 live births during the 3 month span 505 (8 9 percent) were premature This incidence is well within the 7 to 11 percent range given by Dunham but is higher than the average (6 1 percent) reported by 323 hospitals throughout the country

TABLE 1 *Distribution of 485 premature infants according to birth weight*

Birth weight (gm)	Births		Deaths	
	Number	Percent	Number	Percent
0 1 000	27	5 5	25	92 2
1 001 1 500	2	5 5	15	55 5
1 501 2 000	107	21 1	16	15 7
2 001 2 500	329	67 9	12	3 6
Total	485	100 0	68	14 0

Percentage of total births
Percentage of births in weight group

Birth weights The 485 records which could be adequately studied were grouped according to the infant's weight (table 1) More than two-thirds of the births fell into the 2 001 to 2 500 gram group

Sex Although most observers reported a slight preponderance of female premature births 59 0 percent in our series were boys

Length of gestation As shown by fatality studies the length of gestation directly influences the maturity of an infant Because this factor is often indefinite or unreliable it cannot be used as the only criterion for prematurity The definition of prematurity according to birth weight has its faults, but it is the most accurate measurement available Table 2 reveals that about 43 1 percent of these infants had gestational lengths of more than 37 weeks In a series reported by Taback 7 51 percent of the premature infants had gestational periods of more than 37 weeks

TABLE 2 *Distribution of 485 prematu e infants accord ng to length of gestat or and the effect of gestation on the fatality rate*

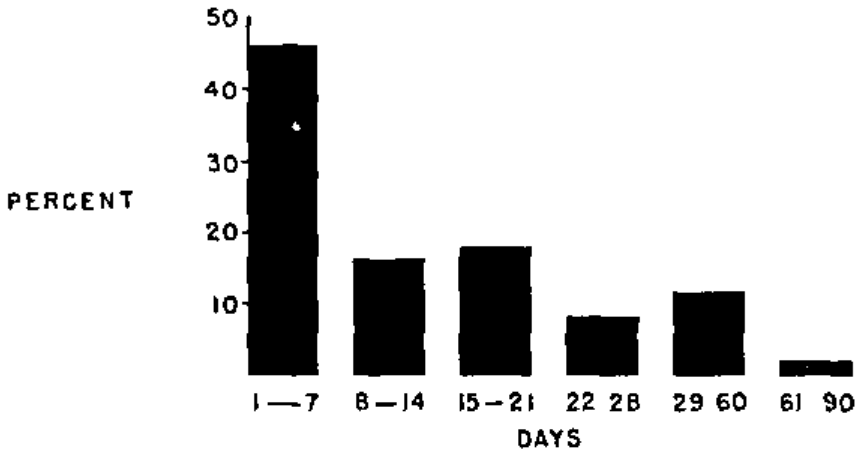
Length of gestat on (weeks)	Births		Deaths	
	Number	Percent	Number	Percent
28 or le s	33	6 8	30	44 1
29 31	22	4 5	12	1~ 6
32 34	78	16 1	14	20 6
35 37	140	28 9	9	13.2
38 - 40	195	40.2	3	4 5
More than 40	12	2 5	0	0
Undeterm ned	5	1 0	0	0
Total less than 37	273 (±5)	56 9 (±1)	65	95 5
Total more than 3~	207 (±5)	43 1 (+1)	3	4 5

Race More than three fourths of the infants in our series were Caucasian (table 3) Because the racial distribution among the 5 651 live births was unknown we were unable to determine the racial incidence of prematurity Other studies have reported a higher incidence in the Negro than in the white race [4]

TABLE 3 *Distr bution f bi ths and d aths f p matu e infants according to race*

Rac	Birth		Deaths	
	Number	P rcent	Number	Percent
Cauca ian	370	~6 3	53	~~ 9
Negro	113	23 3	15	2~ 1
Mongolian	2	0 4	0	0
Total	485	100 0	68	100 0

Age at discharge In a review of the American literature the average length of hospital stay of premature infants who sur vived ranged from 24 to 28 days Figure 1 shows that 80 8 per cent were discharged within 3 weeks after birth Perhaps the high percent discharged within the first week is a consequence of the large group who weighed from 2 001 to 2 500 grams at birth It has been the policy in our nursery not to discharge premature infants until they have achieved a weight of 2 270 grams



F g 1 Length of tay n ho p tal fo 485 p mature fant

FATALITY STUDIES

Data collected from 19 large United States hospitals dis closed premature infant fatality rates ranging from 15 9 to 32 per cent A later report gave an average fatality rate of 21 5 percent in 393 hospitals In our series there were 68 (14 percent) deaths (table 1) Of the 14 who were born outside the hospital, 5 (35 7 percent) died Although thi is too small a number of births out side the hospital to warrant definite conclusions this figure closely approximates the fatality rates of such births reported by others Forty (59 percent) of those in our series who died were infants whose birth weight vas 1 500 grams or less The rates in each weight group in our series closely parallel those reported by other authors

Sex Table 4 shows that in our series 69 1 percent of the deaths occurred in male infants It will be recalled that 52 2 per cent of all the premature infants were boys This is in accord with other reports of higher fatality rates in premature male infants but no satisfactory explanation has been advanced

Length of gestation Despite the fact that about 56 9 percent of the births had gestational periods of 37 weeks or less 65 (95

percent) of the deaths occurred in this group (table 2) Although not shown in this table, it has been found by Steiner and Pomerance[5] that for a given weight group, the fatality rate varies inversely with the length of gestation It would seem, therefore, that length of gestation is a very important factor influencing the chance of survival of premature infants

Race It has been stated that the fatality rate is higher for Negro than for white premature infants [1] As may be seen in table 3, however, in our series the racial fatality rates corresponded very closely to the racial birth rates The much lower fatality rate for Negroes in our study (13 3 percent) than in the study by Crump et al [6] (22 2 percent) cannot be adequately explained

TABLE 4 *Effect of sex on the fatality rates of premature infants*

Birth weight (grams)	Number of births	Deaths			
		Male		Female	
		Number	Per cent	Number	Percent
0 1 000	27	12	48 0	13	52 0
1 001 1 500	27	13	86 6	2	13 4
1 501 - 2 000	102	14	87 5	2	12 5
2 001 2 500	329	8	66 6	4	33 3
Total	485	47	69 1	21	30 9

Delivery Tyson stated that a breech delivery is the most hazardous of ordeals for the premature infant In his study, the fatality rate following a breech delivery was 60 percent In our series, breech extraction accounted for only 11 6 percent of the deliveries, but 32 4 percent of the deaths (table 5) Despite numerous allusions in the literature to a high fatality rate following cesarean sections, there was only 1 death among the 19 premature infants delivered in that manner in this hospital

Time of death The first week of life is an extremely critical period for the premature infant This has been especially true in this hospital where 97 percent of the deaths of premature infants occurred within the first week of life (table 6) Elsewhere the situation has differed very little Simpson and Geppert[10] reported 57 percent of deaths within the first 24 hours, and from 80 to 90

TABLE 5 *Typ f d l ry f th p matur f t and th f tal t es lt g f m a b typ*

Typ of d l ry	B th		D h	
	N mbe	P nt	N mb	P e t
Normal p t o	290	59 8	31	45 6
L w f p	112	23 1	12	17 6
O he f c p	5	1 0	0	0
C	19	3 9	1	1 5
B h	56	11 6	22	32 4
V o	3	0 6	2	2 9
Tor l	485	100 0	68	100 0

percent within the first week Tyson[4] reported 81 percent of deaths within the first 2 days (compared to our 79 4 percent) and stated that babies who were born dead or who died within the first 2 days of life usually died from complications of preg nancy labor or delivery Reduction of premature fatality rates is therefore the responsibility of both the obstetrician and the pediatrician Adherence to certain principles of the management of premature labor and its complications as described by Taylor et al may accomplish much toward this end

TABLE 6 *T me of d th f pr matur f t*

T m f d th	D h	
	N mbe	P
W th f h u	3	4 4
W h f 12 hours	29	42 6
W th f r t 2 d y	54	79 4
W h n f 4 d y	63	92 6
W th n f r 8 d y	66	97 0
W th f r 30 d ys	68	100

Cause of death An autopsy was performed on 65 of the 68 premature infants who died in our series The various causes of death, as obtained from the autopsy reports, are shown in figure 2 These data are presented not because we feel that they represent the true causes of death, but rather because we wish to emphasize the need for careful postmortem examinations and proper certification of causes of death, as strongly advocated by Bundesen et al [11] They stated that a death which is diagnosed as being due to prematurity per se (used interchangeably with anoxia in our autopsy reports), may actually be due to abnormal pulmonary conditions Atelectasis was reported as the cause of death in 29 2 percent of our cases, although Potter[12] stated that atelectasis was only a symptom of some underlying abnormality and should not be considered as a cause of death

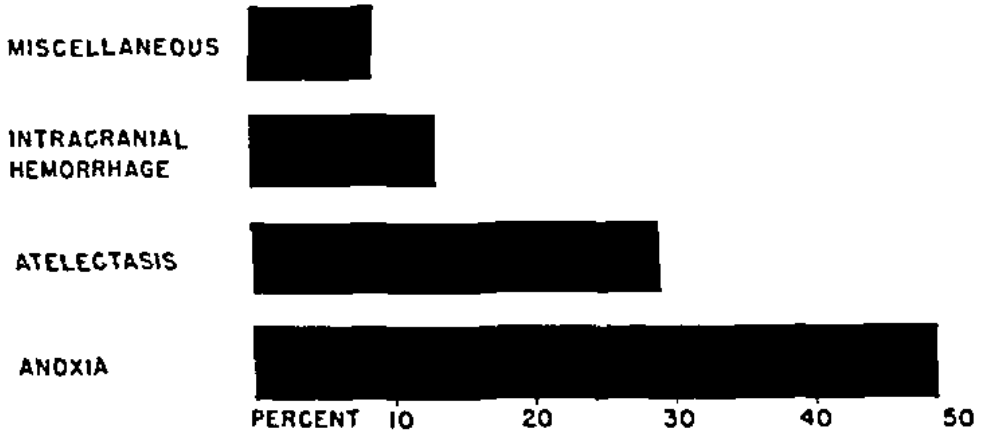


Figure 2 Ca ses of death of 65 p emat e infants.

Of the 65 infants on whom autopsies were performed, pulmonary hyaline membranes were found in 10 (15 percent) on microscopic examination Seven of these 10 hyaline membranes were found among the 19 infants whose deaths were attributed to atelectasis The significance of the pulmonary hyaline membrane has been the subject of much speculation, and some have even called it an "eosinophilic herring " Whether it actually is a cause of death or just an incidental finding awaits further study [13] The remaining three patients with pulmonary hyaline membrane in our series also had intracranial hemorrhages No hyaline membranes were found among those whose deaths were attributed to anoxia

COMMENTS

In most premature births, the cause of prematurity is unknown Some known complication which might contribute to the early termination of pregnancy occurs in about 40 percent of the cases [1 15] Porrerance and Steiner[15] stated that of these complications toxemia was the most common (20 percent), followed by placenta previa and abruptio (16 percent), serious maternal

illness (4 percent) abnormalities of the genital system (3 per cent) syphilis (1 percent) and polyhydramnios (1 percent) In our study 40 9 percent of the mothers had complications which included toxemia (15 2 percent) abruption of placenta (6 8 per cent) placenta previa (2 1 percent) syphilis (0 8 percent) and other miscellaneous complications which totaled 14 4 percent Premature rupture of the membranes which occurred in 95 (16 6 percent) of our cases was not included as a complication be cause it has been shown that although this phenomenon occurs slightly more often prior to premature than prior to full term de liveries the difference is insignificant [1]

Twenty eight pairs of twins (11 5 percent) were included in our series There were 9 deaths among these twins representing a higher fatality rate than the average for both single and mul tiple births It has been suggested that single and multiple births be grouped separately because the latter comprise a larger per cent of infants in the 2 001 to 2 500 gram group, who are never theless mature In addition to the higher fatility rate among our twins a comparison by weight groups disclosed that only 50 per cent of the twins in the 2 001 to 2 500 gram group (67 9 percent of the entire series fell in this weight group) From our studies, therefore it would seem to be incongruous to group multiple births separately on the basis of increased maturity

Different writers have attempted to correlate incidence of pre maturity with seasons and have variously reported higher rates in fall winter, or summer We were unable to detect any signifi cant seasonal variation Only two of our premature infants de veloped total blindnes due to retrolental fibroplasia The birth weights of these two were 1 053 and 1 198 grams giving an in cidence of 3 7 percent among all the premature infants who weighed 1 500 grams or less at birth

SUMMARY

For the sake of uniformity all studies concerning premature infants should adhere to the criteria of prematurity recommended by the American Academy of Pediatrics In a series of 5 651 live births 8 9 percent were premature Although sex seemed to af fect the incidence of prematurity very little more than 69 percent of the deaths were in male infants Among the 485 premature infants who could be adequately studied there were 68 deaths (14 percent) There seemed to be a definite correlation between length of gestation and degree of maturity because more than 95 percent of the deaths occurred in infants who were born after less than 37 weeks gestation Race had no apparent effect on the premature fatality rate A larger percent of deaths followed breech extraction than any other form of delivery Ninety seven percent of the deaths occurred within the first 8 days most of these within the first 2 days

There is a need for more careful postmortem examinations to determine the exact cause of death of premature infants Single and multiple births should be grouped together in studies of this kind because there was no evidence of increased maturity among the multiple births

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United States War Losses in Korea

MORE than 24 000 battle deaths have been reported among the armed forces of the United States in Korea since hostilities began on June 25 1950 This number includes those killed in action or who died of wounds and the known dead among the men originally reported as missing In addition about 9 000 are still on the list of the missing On the assumption that about nine tenths of these men are dead the battle death toll in Korea rises to about 32 000 This total is somewhat more than one tenth the corresponding figure for World War II (December 7 1941 to August 1945) and compares with well over 50 000 battle deaths suffered by the Army land forces alone in the Pacific area during that conflict.

Because of the greater number of men under arms in World War II the disparity in the battle death rates is not as large Our battle death rate in Korea, based upon the estimated toll of 32 000 averaged 3 5 per 1 000 a year from June 25 1950 to June 12 1953 This compares with an average battle death rate of 6 9 per 1 000 a year among the armed forces of the United States in World War II

The heaviest losses of our armed forces in Korea were suffered in the early part of the conflict as the accompanying table shows For the second half of 1950 the battle death rate based upon notifications to next of kin was 7 9 per 1 000 a year exclusive of those reported as missing in 1950 and later found or presumed to be dead The rate dropped to 3 2 in 1951 and further to 1 3 in 1952 it was 1 1 up to June 12 of the current year These rates are based upon the total armed forces including those in this country as well as those abroad When the battle deaths are related solely to the armed forces overseas the rates for 1951 and 1952 are raised to 10 9 and 3 9 per 1 000 respectively In World War II the overseas battle death rate for the United States Army varied from a low of 12 1 per 1 000 in 1943 to a high of 33 5 in 1944 with an average of 22 5 a year for the period 1942 to 1945

In the Korean conflict as in World War II the Marine Corps suffered relatively heavier losses than any other branch of the service Allowing for the probable dead among the missing the battle death rate for the Marine Corps from June 25 1950 to June 12 1953 averaged 7 1 per 1 000 a year compared with an average of 6 3 for the Army, 0 5 for the Air Force and 0 2 for the Navy Similarly, from December 7 1941 to December 1945

the average annual battle death rate for the Marine Corps was 14 3 per 1,000, as against 9 4 for the Army, which then included the Air Force, and 4 2 for the Navy Of the battle deaths among the land forces during World War II, more than 15 percent occurred among the Air Forces, in the Korean War the corresponding proportion was somewhat less than 5 percent

Battle death rates by branch of service
United States Armed Forces June 25 1950 to June 12 1953

Year	Annual death rates per 1 000 mean strength				
	Total forces	Army	Navy	Marine Corps	Air Force
1950	7 9	14 5	0 3	25 5	0 5
1951	3 2	6 0	2	4 9	3
1952	1 3	2 2	2	3 9	1
1953	1 1	1 8	1	4 0	1
1950 1953					
Reported	2 6	4 8	2	6 2	2
Estimated Total†	3 5	6 3	.2	7 1	5

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†Includ in dd t n t th k wn de d 90 pe c t of the umb t ll l st d s m g

Data on nonbattle deaths during the Korean War are not yet available for all branches of the service Reports for the Navy and Marine Corps show that the average nonbattle death rate in the three years 1950 to 1952 was virtually the same as the average for the peacetime years 1946 to 1949 In fact, the death rate from disease was actually lower for the war period than in prewar years but this improvement was counterbalanced by an increase in nonbattle injuries From 1950 to 1952 the Navy and Marine Corps had an average annual death rate of 1 6 per 1,000 from nonbattle injuries and 0 3 from disease In the four years 1942 to 1945 the comparable rates were 2 0 and 0 5 per 1,000, respectively Nonbattle deaths in these services averaged about 1 600 annually from 1950 to 1952 and approximately 6,500 a year during World War II

It is a reasonable assumption that in the Army and Air Force, too, the nonbattle death rate in 1950 to 1952 closely approximated that for 1946 to 1949, when it was 2 2 per 1 000—1 5 from

injury and 0 7 from disease On this basis the number of non battle deaths in the Army and Air Force during 1950 to 195⁰ would be about 4 300 annually in 1942 to 1945 the corresponding toll was 17,000 a year

The very low death rate from disease among our armed forces in Korea indicates how very effective our military medical services have been despite the handicap of singularly difficult conditions Poor often primitive environmental sanitation the high prevalence of infectious diseases and extremes of tempera ture created many serious health problems which have been satisfactorily met Losses resulting from exposure to cold have been reduced by instructing officers and enlisted men in pre ventive measures by better clothing and equipment and by improved techniques in the management of cases Protective and sanitary measures have reduced the toll from the epidemic diseases not only among military personnel but also among the civilian population of Korea Altogether, the advances made through experience and research in safeguarding the health and life of our armed forces during the Korean War contribute a new chapter to the history of military medicine

—R pr d f om Stat t al B ll tn J 1953

While psychology is a science psychotherapy is an art that has been practiced consciously or unconsciously as long as human beings have been harassed by pains and aches Not so long ago, menopausal syndromes were cured with ovarian tablets whose content of estrogenic substance was practically nil This is only one arbitrary example of unconscious psychotherapy applied by men of science It is hardly neces ary to mention the therapeutic results of magicians quacks and cultists of different brands Modern medical psychotherapy is an art based on the scientific background of psychology Today its necessity is unquestioned though its indications are not yet so generally recognized by the medical profession as they should be

—JULIUS BAUER M D
n A nal J l nal M d c

THE TRANSITION OF THE CIVILIAN PHYSICIAN INTO THE AIR FORCE

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THE transition of the physician into an effective member of the Armed Forces medical team is an important procedure which requires tact, diplomacy, and training on the part of those responsible for its success Many physicians who are called into the Air Force as a result of Public Law 779 are likely to have a sense of frustration toward the service In the words of Churchill (2), "the moment a doctor gives way to frustration and reacts emotionally he can see nothing good in the service and becomes resentful toward it." If these physicians can be stimulated to think about military service on an intellectual rather than an emotional basis, we have done a great deal to develop an immediately effective member of our medical team Much of our indoctrination is therefore directed along these lines

This paper describes the methods used in the Officers Indoctrination Course which is attended by all newly commissioned Medical Service Officers of the Air Force, but our remarks shall be confined in general to the Medical Corps

The assignment orders of newly commissioned officers provide for temporary duty at the Gunter Branch, U S Air Force School of Aviation Medicine for a period of 35 days, after which the officer proceeds to his assigned duty station A cordial letter containing helpful information is immediately sent to each officer informing him (1) what to bring in the way of money, personal effects, and equipment, (2) what housing is available (3) how to reach the base including travel procedures, (4) where to write concerning any change in orders and (5) whom to contact upon arrival in Montgomery, Ala

Induction into the service creates many serious problems in the physician s personal life, and an effective program of personal aid has been established The legal assistance officer works closely with new officers, helping them in obtaining power of

(1) Gunter Branch U S. Air Force School of Aviation Medicine Gunter Air Force Base Ala

(2) Churchill E. D Standards of military practice in Army Medical Bulletin, Hq Third Army Ft. McPherson, Ga Apr 1952

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attorney aids them on income tax problems and gives personal and legal advice A mature and experienced officer of the Medical Service Corps is assigned as class supervisor for the indoctrination class

The student officers spend a week of in processing followed by the formal 4 week (156 curriculum hours) course (3) This in processing includes procurement of uniforms accomplishment of physical examinations initiation of personnel records and other essential procedures The instructional program is based on teaching methods especially designed for an indoctrination program Visual aids especially films, are used for dynamic presentations Panel discussions conference type classes, practical demonstrations and participation in field exercises are employed extensively in teaching On the first day of the course a one-act play or skit" is presented to inform the newly commissioned officer of the purposes of the indoctrination course Students react very enthusiastically to this presentation

The instructional material in the 4 week course may be broken down into (1) duties and responsibilities of all Air Force Officers (2) military medicine (3) special procedures of the Air Force Medical Service and (4) duties and responsibilities of the 6 technical components of the Air Force Medical Service

To perform the duties of a pilot, physician, engineer or lawyer, an officer must have certain basic information The organization and function of Department of Defense agencies and the position of the Air Force in the broad framework is explained Lectures are given on current concepts of air power The functions of the Department of the Air Force down to the lowest echelon are thoroughly examined Indoctrination on aircraft and equipment currently in use is covered and the relation of flying safety programs to the Medical Service is outlined Rescue and survival procedures are explained to show their influence on combat strength and morale Personnel classification procedures are covered both for officers and airmen with particular emphasis on those which affect the newly commissioned officer of the Medical Service

The student officer is instructed in how to wear his uniform correctly and in the customs traditions and privileges of the service This area includes military courtesy, leadership responsibilities and management methods under military situations During the 4 weeks of the course 5 hours are devoted to drill and to basic instruction in participation at formations and ceremonies Nearly every class takes part in a military review and retreat parade

(3) Curr I m I doc na C ur for Off I h Med I S G B h U S A F School f A ia M d G t Air F B Al 1 May 1953

Students are taught how to utilize the Personal Affairs Office in arranging their individual problems to free them from worry and concern and thus increase their effectiveness as officers To aid the new officer in establishing efficient working relationships with those in his unit, military law is comprehensively covered A small number of hours are devoted to basic orientation on military correspondence, maintenance of individual record files and to property responsibility Because of incidents which have occurred during the Korean action, familiarization with weapons and problems of combat are taught with emphasis on defense against guerrilla activities This instruction on subjects of importance to all officers develops confidence in the student.

The next step is an orientation on military medicine in general Members of the Medical Service must have a knowledge of the areas of professional and related administrative procedures which require particular emphasis or accent in military situations It is carefully pointed out that there is little difference between good professional and medical administrative practices in a civilian institution and in a military installation, but because of the inherent nature of military operations certain precepts, doctrines, and practices are essential The similarities and differences between civilian practice and military medicine and the duties of a medical officer are clearly defined

Selection procedures and physical examinations are presented with emphasis on conservation of public funds Recent advances of a professional nature applicable to military situations such as a résumé of the latest information concerning treatment of shock and use of blood and blood substitutes, are explained A planned program on the use of forms, records, and reports common to the Medical Service and Department of Defense agencies is presented

Of the total number of 156 instructional hours in the course, 31 hours are devoted to preventive medicine Field sanitation is covered with demonstrations of the latest means and devices for conserving health under situations such as those encountered in Korea today In the instruction in preventive medicine, every student takes part in a practical exercise and writes the sanitary orders for a simulated troop movement to a newly established base in Korea

Fifteen hours of instruction are devoted to the medical aspects of atomic warfare, and additional time is devoted to orientation on biological and chemical warfare Emphasis is placed on the preventive and corrective measures necessary in case of AFC warfare attacks Air Force procedures in medical rehabilitation and on military neuropsychiatry are explained

Whether or not a medical officer becomes a flight surgeon, he will be concerned and involved in endeavors contributing to the effective care of flyers This third area is essentially a basic orientation in aviation medicine A brief but comprehensive survey it includes aviation physiology, air evacuation the aircrew effectiveness program and functions of the flight surgeon together with current problems of research in aviation medicine Responsibilities of the Medical Service in aircraft accidents and in problems of industrial medicine are discussed

A résumé of the organization of all units of the Air Force Medical Service and the current status of medical facilities is given all students The employment of medical units under combat conditions and the air transportable 36 bed dispensary are realistically demonstrated These procedures show the medical officer how aviation medicine provides effective health conservation of air power The necessary qualifications for board certification in aviation medicine which was recently authorized and advantages of a career in this field are presented and described

In the latter part of the course sectionalized instruction periods for each of the 6 different officer components are held during which the duties and responsibilities of each corps are described Topics presented with the specific approach necessary for the orientation of each technical component include (1) hospital and dispensary procedures, (2) medical records and reports, (3) medical boards (4) medical service in a theater of operations and (5) special responsibilities of each corps or component of the Air Force Medical Service team

This sectionalized instruction provides for the correlation of the 6 technical and professional components comprising the Air Force Medical Service and includes a candid explanation of the interrelationship necessary for an integrated and efficient military team Specific duties and responsibilities of the medical officer in the performance of mass physical examinations, and maintenance of clinical records are discussed The functions of the Dental Corps and the purposes of dental records and dental identification are explained The work of the Veterinary Corps in the subsistence inspection program is outlined Professional ethics of women in the Medical Service is covered for the female components Medical Service Corps Officers receive instruction pertaining to their support of professional officers Advantages of careers in the various corps their interrelationship and duties in combat theaters are included

In addition to the precourse processing and orientation during the first 7 days students are invited and encouraged to seek advice from any member of the staff at personal counseling

periods during which the class supervisor plays a most important role He is able to answer most questions and to assist in solving the usual problems, but uses the resources of the Air University at nearby Maxwell Air Force Base for help when required

As the course draws to a close, special effort is directed toward providing individual preparation for duty assignments All personnel scheduled for overseas assignment attend informative briefings on health conditions in specific areas which are conducted by staff officers who have recently returned from overseas theaters A complete file of data on various medical facilities throughout the Air Force is maintained for consultation by students

TABLE 1 *Distribution by Medical Service component of officers who have graduated from the officers indoctrination course Gunter Branch U S Air Force School of Aviation Medicine*

(5 March 1951 2 May 1953)

Component	Total
Medical Corps	1542
Dental Corps	851
Veterinary Corps	104
Nurse Corps	1091
Medical Service Corps	428
Women Medical Specialist Corps	35
USAF officers not in Medical Service	2
Total	4053

Throughout the indoctrination course we try to impart to the newly commissioned medical officers what might be called a philosophy of service medicine We endeavor to convey the idea that their personal relationship with the patient should be carried over into military service It is emphasized that an airman does not report at sick call to get out of work but is a patient who believes he is ill, and is the same type of patient that they might see in their civilian practice He is treated with respect and consideration in civilian life so why should he not be so treated in the service?

Some will not agree with our attempts to influence these physicians to modernize the grand ward rounds but we point out

that military patients have sensitivities and can be damaged mentally and psychologically by such a medical school an achronism We emphasize how much more value can be derived from consultants visits and picture the idea of grand rounds being held in privacy with available data at finger-tip reach during which the patients are brought in and presented only for examination and questioning

TABLE 2 *D t b t on f phy c prad t m d l p lt*
(5 M h 1951 2 M y 1953)

M d al p ialy	N mbe t f d by pe lty boa d	N mbet qual f d for boa d c t f t on	N mbe w th U g p t l y	T tal
I nal m d t	3	86	167	256
P diatr c	1	58	60	119
P y hiatry	—	36	57	93
P th l gy	1	5	25	31
P d l gy	5	7	9	21
N ur l gy	1	5	7	13
D mat l gy	2	1	5	8
I du trial m d n	—	1	7	8
Pr t m d c n	—	6	2	8
P lmo ary d e	—	—	5	5
Phy l med cin	—	—	1	1
G t te l gy	—	—	1	1
T t ls	13	205	346	564

I dus rial m d p d by p ialty boa d

Emphasis is placed on the importance of medical records in the service and the attitude of the specialty boards and the American Medical Association toward accomplishing this function in a superior manner It is pointed out that military medical records come under the scrutiny and purview of the American Medical Association even though some forms may be different from those used in civilian life It is emphasized that Department of Defense Form 408 is solely for personal convenience to assist one in keeping a record of his service duties and training It is pointed out that this form is accepted by the specialty boards as a record on which to base the amount of credit which may be granted for this training Each physician is given this form and the regulation which explains its use

There is always considerable interest in the instruction devoted to career possibilities in the Air Force It is given with the purpose of presenting the attractive features of such a career as well as to induce the physician to look upon his 2 years in the service as an opportunity for professional advancement. He is given information on the availability and types of service rendered by the Armed Forces Medical Library, the Armed Forces Institute of Pathology, and the Armed Forces Medical Publication Agency

TABLE 3 Di *trib tion of physic an graduates in su gical sp cialties*

(5 March 1951 2 May 1953)

Surgical specialty	Number certified by specialty board	Number qualified for board certification	Number with D rating in specialty	Total
General surgery	4	70	133	207
Ob tetrics and gynecology	2	38	69	109
Ane thesiology	—	20	13	33
Orthopedic surgery	1	10	13	24
Ophthalmology	2	7	14	23
U ology	—	8	14	22
Otolaryngology	4	9	3	16
Neurolog cal surgery	—	2	3	5
Pla tic urgery	—	2	—	2
Thora ic surge y	—	—	1	1
Totals	13	166	263	442

From 5 March 1951, when the first indoctrination course was held, to 2 May 1953, 4 053 officers have been graduated Beginning in October 1952 two classes have been in session con currently, each averaging from 150 to 200 students with 60 to 80 medical officers in each

The distribution by component of the 4,053 officers who have graduated from the indoctrination course is shown in table 1 Of the 1,542 medical officers graduated, 536 have been general practitioners, 564 have had training in medical specialties and 442, in surgical specialties Table 2 indicates the medical specialties of physician graduates and table 3, the surgical specialties The "D" rating as shown in these tables is the initial or lowest level of specialty proficiency in the military

service and identifies medical officers who have completed a minimum of 1 year of an approved residency or fellowship or who have had sufficient practice limited to the appropriate specialty to be acceptable to the specialty board as the equivalent of 1 year of formal training

SUMMARY

In the Air Force Medical Service Officer s Indoctrination Course emphasis is placed on methods for effectively accomplishing the transition of physicians from civilian life into the service. The indoctrination course exists only to serve the new Air Force physician and to assist him in becoming a worthy member of the medical team with the least possible delay Reports from world-wide air bases indicate that this transition is being effectively accomplished and that the practice of providing an indoctrination course for newly commissioned physicians and other health service personnel merits the time and expense involved

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LETTER TO THE EDITOR

To the Editor

An article by Lieutenant Colonel Frank W Chorpenning MsC, U S Army entitled The Treponemal Immobilization Test (TPI) in the Diagnosis of Syphilis, which was published in the June 1953 i sue of the *United States Armed Forces Medical Journal* appears to reflect the belief that the Army Medical Service Graduate School indorses the institution of the TPI test as a method of diagnosis of syphilis by consulting laboratories

To prevent any misunderstanding the Army Medical Service Graduate School wishes to make clear that the opinions expressed therein were those of the author and should not be considered as being repre entative of the current beliefs of the staff of the Army Medical Service Graduate School

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PLASTIC EAR STENT FOR HEARING AIDS

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AN EAR stent developed by the authors promises to meet a variety of needs, particularly the growing demand for greater comfort in the wearing and use of hearing aids The factors which have focused attention on hearing aid comfort are (1) recent developments in hearing aid engineering with their consequent modifications in hearing aid design, and (2) the rapid increase in the number of persons using hearing aids

Hearing aids may be divided into air conduction and the bone conduction types either of which may function through mechanical or electrical means (2) Mechanical methods employ the force of sound waves and natural or mechanical means for amplification Electrical methods gain amplifications through the power of an electric current

The "collector" or "ear funnel" is the oldest air conduction type (2) From time immemorial the cupped hand held behind the ear has been used as an aid The first mechanical means devised to help those with impaired hearing was the "ear trumpet " It was nothing more than a reducing horn, the large area of the horn collecting the sound waves and concentrating them at the external auditory meatus Through the years these horns were refined and made more compact by twisting and turning the long reducing horn back and forth within the collecting bell A telescopic horn easily carried but rather formidable when opened, was a further modification The "apparitor auris" with a small silver tube extending in the depth of the ear, and the "London dome," a small and efficient apparatus carried in the palm of the hand and held up to the ear without attracting much attention, were further refinements (3) Both of these were objectionable because they caused irritation in the external auditory canal The literature reveals that most aids which extended into the external canal were a continued source of irritation In this con

(1) U S Naval Dental School National Naval Medical Center Bethesda Md

(2) Newell A F Handbook of Hearing Aids Harvard House New York N Y 1940

(3) Fredberg M Mechanical aids to hearing Ann Otol Rhin & Laryng 20 138-143 182 190 1911

nection various early attempts to restore the drum by the mechanical use of a pledget of cotton (which was the most succe s ful) precious metal foil or parchment paper were often followed by serious infections and sometimes fatal results (1)

Another type was the speaking tube which was a conserver rather than a collector of sound waves The speaker talked directly into a long flexible tubing which led to the impaired ear The microphone was a small flat box with a delicate film of flex ible metal which the air waves set in vibration and was held close to the ear This principle with the addition of a secondary battery, was later used in the telephone (3) In 1884 Dr Alex ander Graham Bell described experiments at the Volta Labora tories indicating the applicability of the telephone principle to persons with impaired hearing but it was not until almost 1900 that the first commercial instrument was made by the Akouphone Company of Mobile Ala Mears aurophore of the same era had a headpiece as the receiver and microphone for the ear (3)

The idea of a bone conduction type of aid was first mentioned by Ingrassia a Sicilian who died in 1580 who suggested the possible conduction of sound waves through the teeth In 1757 Jorissen a German recommended the use of a wooden rod with one end held between the teeth of the speaker and the other end similarly held by the listener A few years later Buchner, also a German wrote of a man in Copenhagen so deaf that he was un able to hear the sound of a cannon shot off while standing along side it but he could understand a sermon by holding a long wooden stick between his teeth while resting the other end against the pulpit Beethoven after becoming deaf discovered that he could hear music by resting a wooden rod against the side of his head or between his teeth while the opposite end was against the piano (2) The first practical application of this principle was in 1879 when Rhodes patented the audiphone a fanlike device of stiff cardboard or celluloid The edge was held between the teeth while the fan was bowed outward toward the source of the sound The area of the fan acted as a collector of sound waves which it transmitted to the teeth jawbone and skull and thence to the nerves of hearing Soon after Graydon introduced the "dentaphone" and Thomas the osteophone (2)

The ossiphone the first commercial electric bone conduction aid was devised in 1920 in London The first American instru ment of this type called the osophone was manufactured in 1923 by Gernsback It was not until 1932 when Lieber of Sonotone Corporation introduced his instrument that any satisfactory de gree of efficiency was obtained (2)

Improvements of electrical hearing aids have been made within the last decade At the beginning of World War II electronics

probably led the field in progress and in development, and electric hearing aids were benefited by improvements in vacuum tubes and batteries There are now between 30 and 40 manufacturers of hearing aids A list of accepted aids by the American Medical Association may be obtained from the Council on Physical Medicine, 535 North Dearborn Street, Chicago 10, Ill By the use of different receiving units, the devices may be adapted for air or bone conduction (4) Each consists of (1) a trans

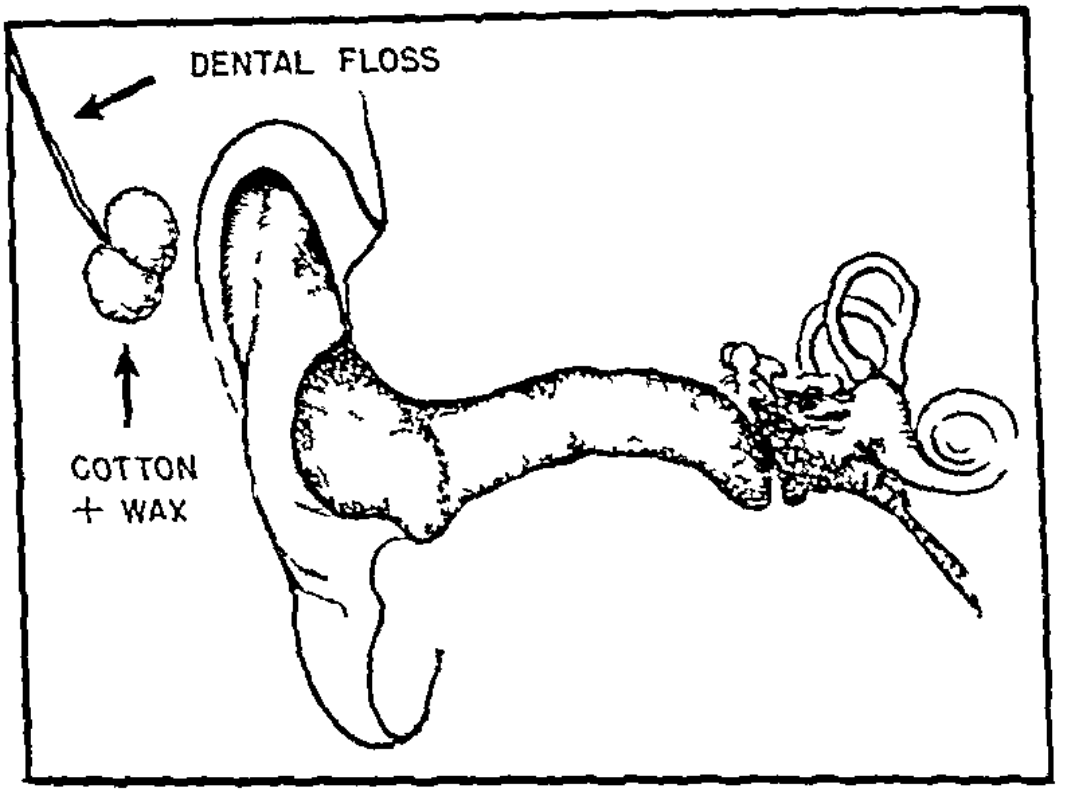


Figure 1 Pellet ready to insert into canal

mitter which picks up sound waves and converts them to electrical impulses (2) a receiver which converts electrical impulses (sometimes magnified by an amplifier) back into sound waves (3) a dry cell battery which furnishes the operating power of the system (4) cords which connect the parts of the system, and (5) an amplifier, either of the carbon or vacuum tube type, with a regulator to control amplification, which magnifies the electrical impulses (2)

The increased effectiveness of hearing aids and the changes in hearing aid design have encouraged increasing numbers of people to give them a trial In 1943, about 110,000 sets were purchased, in 1946, more than twice that number (225,000) were sold (5) An increase of over 100 percent in a space of 3 years

(4) Rose R W Hearing aids win new popularity Hygeia 25 188 Mar 1947
(5) Berry G H Hearing aid evaluation and practicability of hearing aids with view to current literature Ann Otol Rhin. & Laryng 1. 57 500-508 Jun 1948

is significant It was estimated that in 1948 there were 800 000 hearing aids in use and that the average age of the purchaser was 55 years Manufacturers estimate that more than 1 million persons in this country are wearing such aids and that 4 million others would benefit from using them

With rapid developments in engineering design and with the number of users increasing constantly, the factor of comfort for the wearer has been assuming greater importance The development of an ear stent fabricated to meet the needs of the individual offers a promising method of providing complete comfort for the wearer of a hearing aid Fabrication of the stent is not difficult and can be accomplished by a dentist using the following technic

Assembling materials The impression procedure requires materials which are available in most dental offices a small plaster bowl plaster spatula alginate impression material cotton dental floss baseplate wax beeswax wax spatula, and a burner

Preparing the patient The patient is placed on a table lying on his side in a comfortable position with the ear to be fitted upward The canal is carefully cleaned of any debris or wax by a cotton covered applicator

Preparing for taking the impression A piece of dental floss is tied around the middle of a pellet of cotton about the size of a

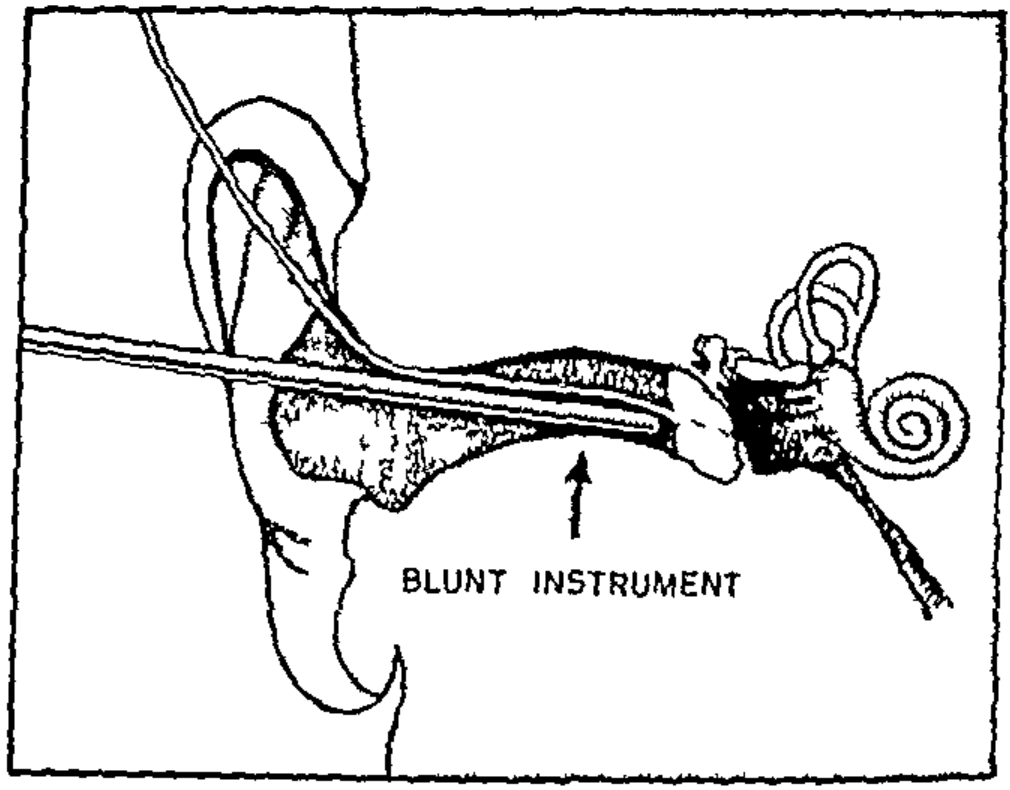


Figure Pellet in place against tympanic membrane

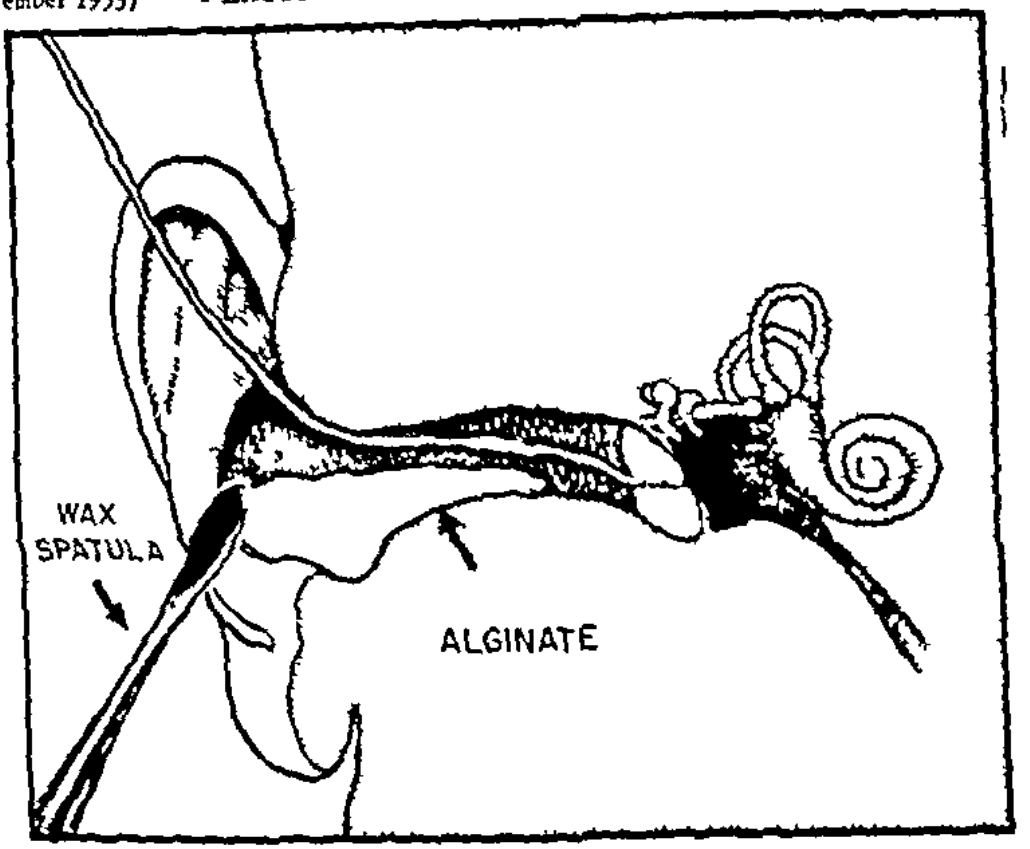


Figure 3 Applying impression material.

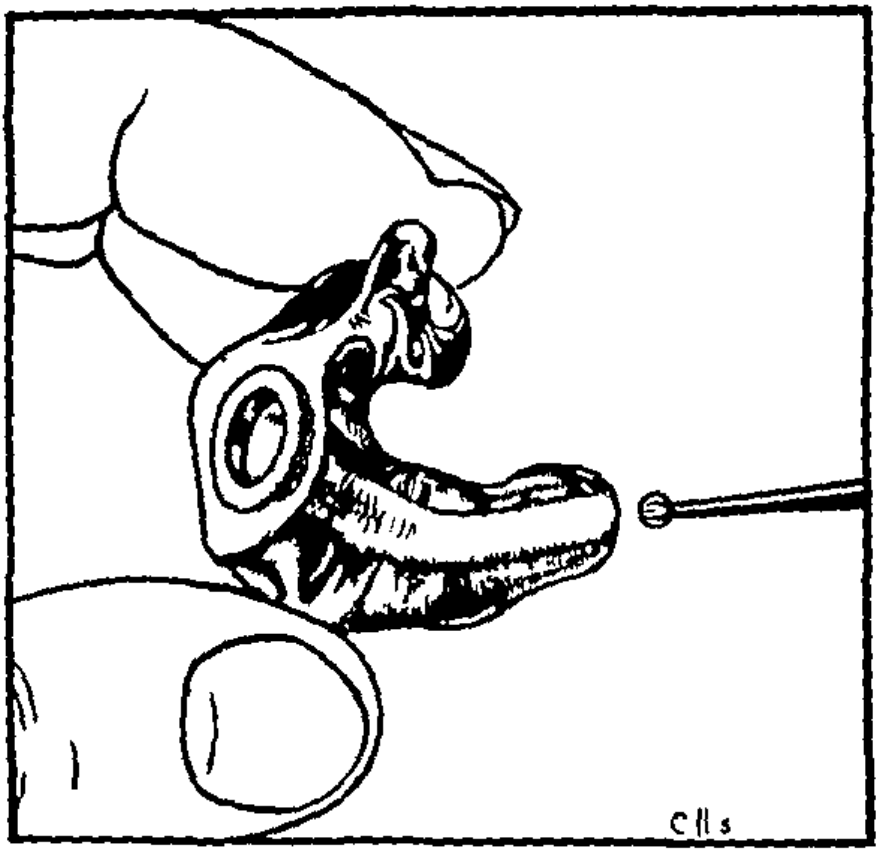
dental cotton pellet Wax heated in a spatula is touched to the cotton, which becomes saturated While the wax is still warm, the cotton pellet is gently pushed by a blunt instrument into the canal to the proper depth (figs 1 and 2) The excess dental floss is deflected from the field of operation

Taking the impression One half unit of alginate impression material is mixed according to the manufacturer s directions The mixture is permitted to flow down the side of the canal, using gentle force if necessary Care must be taken not to trap air in the canal (fig 3) An excess of material is poured around the external surface of the canal to facilitate removal of the impression and to obtain an accurate adaptation of the external portion of the ear insert

Removing the impression The tissues in contact with the impression material are gently pulled away, and the impression is removed by putting tension on the dental floss and on the mass external to the canal A steady pull will remove the impression intact (fig 4)

Preparing the impression The wax impregnated cotton is blended carefully to the alginate impression material by flowing wax to form the bond A thin layer of wax is flowed over the entire surface of the alginate impression that will contact tissue This is to compensate for final polishing and to fill in any small artifacts (fig 5)

Finishing and polishing Any flash and protruding defects are trimmed off with mounted stone care being taken to avoid alterin_ the original contours The auditory* canal is cut through the plastic material with a large round bur in a straight hand piece (fig 7) The canal* is finished and smoothed with stones and with string impregnated with pumice For final polishin_



Figu 7 C tt g a d tory c al

a soft ragwheel is used with wet flour pumice under light pres sure The en_ine is run at slow speed to avoid burning the surface of the acrylic The irregular surfaces are similarly pol *ished but with felt cones and fine bristle brushes* A high surface polish is imparted with dry ragwheels cones and brushes, and whiting

SUMMARY

Comfortable plastic stents (or inserts) for hearing aids can be made by u ing the technic described The individualized prosthesis is accurately adapted to the ear canal so that there are no irritating pressure points The material used is practi cally indestructible Scratches or etching by organic solvents can be removed by polishing This precisely fitted stent promises greater comfort to the increasing number of wearers of hearing aids

PROSTHETIC DENTISTRY AT A REPLACEMENT CENTER

WILLIAM [illegible] (1)

THE most difficult part of [illegible] is to provide adequate dental treatment to a [illegible] number of troops with a minimum number of dentists. This problem is present overseas and in the zone of the interior and should [illegible] in the near future. It is necessary that the Army Dental Corps adjust itself to this situation and somehow arrive at a practical method for coping with it while maintaining our high standards of dental care. One phase of this problem is prosthetic [illegible].

As chief of the Dental Prosthetic Service at this station for the past 2 years I have come to know the sorrows and frustrations of attempting to give dental attention to an overwhelming number of patients. A large percent of the 20,000 troops here are transient, with periods of duty varying from 2 weeks to 3 months. Thus the dental problem never ends, for as fast as one group is treated another takes its place. Most of the men attending the Schools or in the Replacement Center are doing so as a preliminary to overseas shipment. Consequently the class I restoration on overseas shipment places a tremendous burden on the Dental Service to enable the men involved to meet the requirements of having sufficient teeth to masticate the Army ration.

Dental facilities consist of a 15-chair clinic (now an additional section built onto it to house the Station Dental Laboratory), a 15 chair clinic connected with the hospital and a physical examination section. Of the 37 dentists assigned to the unit 4 are assigned to prosthetics 1 to the 15-chair clinic and 2 to the 8-chair clinic. Two laboratory technicians are assigned to the smaller clinic to pour casts prepare bite rims do articulations and most important of all, do the crown and bridge prosthetic for that clinic. The main laboratory consists of 11 technicians, [illegible] whom had never been in a dental laboratory up to 2 years ago. The latter graduates of the Dental Laboratory Technicians' School at Brooke Army Medical Center, through their performance have reflected the careful selection and outstanding training of the School is providing in a 16-week course. Every one is well grounded in all laboratory technics and required only some additional further experience to develop into excellent technicians.

(1) [illegible]

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Although these problems and conditions are common I want to show what steps have been taken to cope with them here in the hope that others will write of the methods they have developed to solve the same problems so that a logical standardized solution may be reached

The primary mission of the Dental Corps is to maintain the dental health of the Army and we must decide from a prosthetic viewpoint how this mission can best be accomplished We must compromise because with the relatively few dentists maintenance of complete dental health in all soldiers is impossible This is particularly true in a replacement center where 230 new men arrive every week 50 percent of whom are in class 3 4 or 5 Added to this are the requirements of the schools and permanent personnel It follows that replacing every missing tooth would result in complete pandemonium

Therefore the first rule we made was that only those patients in class 4 would receive dentures This causes a certain amount of dissension in some patients but, when time is taken to explain the reasoning behind it they too see that the ruling is justified As soon as this is decided the question arises as to who is in class 4 The Army regulation defines a patient in this category as anyone unable to masticate the Army ration It is impossible to make a certain number of opposing posterior and anterior teeth the deciding factor because as we all know ability to masticate with a certain number of teeth varies greatly Some are more adaptable to change Others who have for one reason or another been missing a great number of teeth for several years have learned to get along well with what they have A man must have a definite incentive to wear dentures particularly when they cost him nothing They must either greatly improve him esthetically or he must notice an almost immediate improvement in his ability to chew otherwise he soon forgets to put them in his mouth We have not improved his dental health simply by making dentures for him and have probably denied someone else the opportunity for dental care Thus for proper classification, careful analysis of each patient must be made at the outset

This is accomplished at our station in the following manner When the patient is first seen in the clinic examining room he is temporarily placed in class 4 if he has less than 3 posterior opposing teeth or if he specifically requests replacements Full mouth roentgenograms are ordered and he is given an appointment with the prosthetics section for consultation The operative and surgical sections receiving a request for replacements screen the man more thoroughly and if they believe replacements are possibly justified send him for full mouth roentgenograms and appointment to the prosthetic section Two morning hours are reserved biweekly by the prosthetic officer or officers for con

sultation Sufficient time is provided for careful analysis of each patient. Here, the number of teeth is not considered, but rather whether replacements will or will not materially improve dental health A sheet of paper cut to size is attached to the dental record and a short history taken Further pertinent comments are made either for or against denture construction If the patient is deemed to have sufficient teeth this and the fact that he does or does not agree is noted Careful explanation of our reasons for a certain diagnosis almost always results in a favorable reaction For those requiring dentures, an attempt is made to foresee which teeth must be removed for good denture construction By deciding on which teeth must be removed before rather than during dental treatment, the patient is more easily convinced that we are attempting to be of service to him Carious exposures detected during operative procedures may necessitate the loss of more teeth but he can easily appreciate that this is an unforeseen circumstance Teeth requiring special restorations for better den ture placement are noted although the philosophy of the best dentistry for the most people" limits this somewhat. Wherever possible, endodontia rather than extraction is resorted to for the anterior teeth We believe that not only the patient benefits but the time required is much less than that needed to remove the tooth and construct a bridge

With regard to anterior tooth replacements, most dentists agree that a well placed fixed bridge is far superior to a removable partial denture, except in a few select patients Consequently, when only anterior teeth are involved, we either construct a fixed bridge or nothing at all In the long run, the patient's dental health will benefit more by our having the courage to refuse him temporary partial denture replacements When his training period is completed and he obtains a permanent assignment, sufficient time will then be available to give him the bridge which he needs Although it is not his fault he is being moved so rapidly, neither is it ours, and I don t think we should compromise good dentistry because of it Therefore no man is held from overseas shipment for missing anterior teeth A year on a prosthetic truck in World War II convinced me that bridge construction is available almost into the front lines of combat I do not wish to leave the impres sion that the man without anterior teeth is neglected If he is to be here at least a month and has healed sufficiently he is given a series of appointments and a bridge is completed

On completion of the diagnostic period, treatment is dis- cussed with the patient and he is given a registration date which is noted on his dental record This date varies depending on healing time, time remaining at this station, necessary operative procedures, and other variables which enter into favorable denture construction A registration book is kept with each page repre

senting a date, and the patient s name rank and unit are listed on the appropriate page Those requiring full dentures are referred to the surgical section if necessary, while those needing partial dentures are referred to the operative section where sufficient appointments are given to allow complete restoration of the teeth that are to remain The first appointment is usually in 2 or 3 weeks because of the operative workload and in the intervening period necessary extractions can be accomplished An operator accepting a patient assumes the responsibility to see that the operative work is completed by the listed registration date

Each day one of the prosthetic assistants checks the registration book and calls in all patients listed for that particular day Except in a few instances when operative findings necessitate a change in diagnosis only a few minutes is involved in checking to see whether the mouth is ready for impressions Thus these patients can be worked in without a formal appointment and time is saved in not having a man arrive for his impression appointment before his mouth is completely prepared We require that all operative work be completed in both jaws before any denture construction is started It is much better for a patient of this type to be held from overseas shipment and his dental treatment completed once and for all than to send him on his way with a mouth that will need reconstruction again within a few months For all practical purposes this limits operative procedures for transient personnel to those in class 4 Permanent personnel are regularly surveyed and treated to include all classes Therefore we believe that transient personnel would be afforded the same opportunity when they are permanently assigned whether overseas or in the zone of the interior

If the mouth has healed sufficiently and the operative work is complete an appointment for an impression is made These appointments are restricted to a certain definite number each day so that an even flow of work to the laboratory is provided This requires making appointments for 2 or 3 weeks ahead but this disadvantage is more than offset by the fact that the laboratory work load is kept on an even keel Rush periods which are the cause of much poor denture construction are minimized

Much time and care are taken at the impression appointment to get as ideal an impression as possible Minutes here save hours later in adjustment For partial dentures well defined rest seats are prepared throughout the mouth as necessary For a rest to function properly the rest seat must be prepared according to established standards whether the tooth involved has a restoration in it or not, otherwise any preparation is useless Results observed in most mouths subjected to partial dentures without rests give the impression that stations constructing them are in

the main getting around the class 4 restriction rather than caring for the patient's dental health In the impression procedure, we have found controlled water temperature, the use of distilled water, and arriving at a definite time of set makes for better fitting dentures besides eliminating remakes which are most annoying when every minute is precious By using a timer and referring to the manufacturer's directions for time of set we were surprised at how far off our estimated time had been, and were rewarded with much more precise fitting of our partial castings In addition, by eliminating variables, setting time from mix to mix changes only slightly Trial and error will thus produce a uniform setting time suitable to any given operator

Partial denture construction at replacement center level, due to workload, has always presented the problem of whether to use wrought bars and wire as a framework or to attempt complete castings With the advent of preformed wax and plastic patterns and their inclusion in the Armed Services Catalog of Medical Materiel, cast frameworks can be produced almost as rapidly and with as much ease as wrought work The superior strength, fit, and esthetic results make this little extra time well worth while Careful screening of prospective patients with subsequent reduction in the number of partial dentures constructed allows for any extra time necessary Benefit to the patient in service and to the Army and Veterans Administration in remakes throws the balance far over on the side of the casting Surprisingly enough, tests conducted at the Central Dental Laboratory at Walter Reed Army Medical Center showed that the cost and time factor for casting procedures was closely comparable to that for wrought-wire fabrications This included cast palatal bars and horseshoes for partial upper dentures as against full acrylic palates with wrought clasps Consequently, I believe wrought-wire dentures, except when indicated in a few patients, should become a thing of the past in Army dentistry Up to May 1952, we followed this line of thinking and cast all framework in gold In May 1952, the Walter Reed Laboratory started using chrome cobalt for all castings in lieu of gold It not only was much cheaper but also produced a vastly superior framework The one contraindication of too great clasp rigidity was overcome by locating a commercial product demonstrating almost as great clasp elasticity as cast gold I have adjusted well over 100 of these with no greater a breakage ratio than with cast gold When it is believed that greater resiliency is needed to protect a weakened abutment, 18 gage round wire for the retention arm can be incorporated into the casting as is done with gold

Due to the added equipment and experience needed for this work accomplishing it at the station laboratory level was and is not feasible Thus we instituted a system with the cooperation

of the Walter Reed Laboratory whereby we design and block out the master model and send it to them for casting The bare casting made to our specifications is returned and we complete the case This has worked out very satisfactorily in that a minimum of Central Dental Laboratory time is used with the best result for us Our technicians can now be concentrated in the setup and finish sections, resulting in greater workload ability with no reduction in quality Other stations in this area are being provided the same service and I am sure any other central dental laboratory would be willing to do the same thing for its stations If this service is not available the cast gold framework would still provide a very satisfactory denture

Little has been said about full dentures because they do not present the administrative problems encountered in making partial dentures There is no question as to who should be treated if a man has *no* teeth he needs treatment We encourage transient personnel with ill fitting full dentures to await assignment to a permanent station Appointments for full denture construction vary slightly from those for partial dentures in that we give each patient all of the necessary appointments at his tray impression sitting Thus, once started, he receives his dentures in the shortest possible time rather than being put off because of a full appointment book

The most important sitting for any prosthetic patient is the insertion sitting and observation has shown that it is the one most neglected by the dentist Here years can be added to the life of the denture by taking a few minutes to explain its pitfalls, its capabilities, and, most important care of the denture and the mouth From the time a patient is admitted to the clinic until his mouth is rehabilitated care of the mouth is stressed by all operators The reasons for it and the benefits derived are gone over again and again Thus by the time dentures are inserted the mouth is in good health and ready to receive them I realize that some of the dentures we inserted are worn for a short time and discarded This is inevitable in a free* service no matter how carefully the patients are selected but if we have convinced the man of the necessity for oral care both he and the Army have been benefited Consequently after the denture is inserted and the occlusion carefully adjusted oral care is again discussed stressing 9 minute brushing *by a clock* The fact that the gingiva and the tongue as well as the teeth require stimulation is pointed out The reasons for removal of partial dentures at night and full dentures for an hour a day are also explained All directions are kept as simple as possible A confused patient or one who concludes that oral care is going to take up a great deal of time will neglect his mouth or at best, go on as he was doing previously This is particularly true of the young man to whom most of our time is devoted

The satisfaction derived from seeing a patient who is a prospect for a denture enter the clinic disinterested in his mouth with its consequent neglect and deterioration and seeing him leave a few months later with his mouth restored to health and seeing him make a definite effort to maintain it is worth all the time devoted to him This feeling of achievement must be attained if continued work under the present adverse conditions is to be tolerable The methods described may not all be applicable at other stations, but if they provide a starting point for better denture service my objective will have been reached The Dental Corps has constantly striven for improvement since its beginning 52 years ago Let us hope that even with the tremendous problems facing us we can continue that trend in the future

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Exhibits on Military Medicine Win Awards at AMA Meeting

At the Annual Meeting of the American Medical Association, held in New York City 1 to 5 June 1953, 13 exhibits from the Army, Navy Air Force, and the Armed Forces Institute of Pathology were presented in the Section on Military Medicine, of which Capt R V Schultz MC USN, Washington, D C , was section representative Certificates of Merit for the exhibit on amphibious and field medicine were awarded to Capt E R Hering, MC USN Lt Comdr F J Lewis, Jr , MSC, USN and Lt C M Smythe MC USN, Camp Lejeune, N C Honorable Mention for the exhibit on medicine and research in diving went to Lt (jg) E H Lanphier MC USN Washington, D C

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES OF THE ARMED FORCES

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THE CLINICAL RECORD

As an Index to Quality of Medical Care *(1)*

ROBERT A BELL *Captain MC USN*

THE quality of medical care is of prime concern to the practicing clinician and should be of no less concern to those who are entrusted with the administration of our Federal hospitals The basic ingredient of high quality medical care is provided by the person with well organized thoughts, analytic ability, and sound judgment These factors, combined with a genuine interest in the problems of the patient, and a bent for intense and concentrated effort, cannot be dispensed with if patients are to receive the best possible medical care The medical record in general, and the clinical record in particular, can only serve as adjuncts to these basic factors in providing medical care The record can save the time and energy of the clinician, and the Cornell Indexes are good examples of what may be accomplished in this area

The Cornell Medical Index affords a comprehensive appraisal of the patient's medical history at no expense of the physician's time and provides replies to a long series of questions which tend to be omitted from routine medical histories From the viewpoint of time alone, the physician can hardly hope to ask and record the results of the many questions which are necessary if he is to gain a proper perspective of the functioning of the various body systems It is difficult in today's era of specialization for a clinician to maintain the interest in all body systems which is needed to enable him to remember to ask all of the pertinent questions

It may be well here to review some of the work which has been done in the standardization of medical records in the Federal Government At present, 2 standing committees are functioning in this area These are (1) the Interagency Committee on Medical Records formed in 1946 by the Bureau of the Budget on request by the President that steps be initiated to carry out certain of the recommendations of the Committee on Integration of the Medical Services of the Government *(2)* and (2) the Interdepartmental Committee for Standardization of Forms The Interagency Committee deals with forms which pertain to military and nonmilitary agencies, whereas the Interdepartmental Committee considers forms used within the Department of Defense

(1) Pr n ed 20 Apr l 1953 to The Sixth Int ag cy Inst tut for F d ral Hos p tal Adm trator t the N t nal Naval Med cal Cente Bethesd Md

The Interagency Committee initiated its work with a study of the medical examination forms in use by Federal agencies As a result, the Standard Forms 88 89 and 90 were revised These forms are in widespread use in the Armed Forces today and they not only aid in standardizing medical histories and physical examinations from a physical fitness viewpoint but provide information in the medical records which continue with the service man and may improve the medical care which can be afforded him

The second class of medical records studied by the Interagency Committee was the clinical records in use by Federal hospitals The first series of forms in the clinical record series were submitted to the Bureau of the Budget early in the summer of 1948 These forms were approved by the Bureau of the Budget and promulgated as standard forms by Circular No A 32 26 August 1948 Included in this series are Standard Forms 501 through 521 The series was confined largely to those required for the care of general medical and surgical patients in a hospital The Committee continued its work on clinical record forms with the development of forms for patients requiring specialized medical care After reviewing a large number of such forms in use by Federal agencies and by private hospitals the Committee decided to restrict its recommendations to a rather limited number of forms With the exception of certain forms in rather wide use in Federal hospitals, the Committee believed that specialized clinical record forms should be standardized only on the request of hospitals actually using the forms The Committee submitted certain additional clinical record forms to the Bureau of the Budget and these were promulgated by Circular No A 3[illegible] Revised 30 March 1950 This circular promulgated Standard Form 532 through 539 The Committee does not plan to recommend any additional clinical record forms for standardization unless specifically requested by some Federal agency

One of the forms the Narrative Summary Form Number 502 provides for a summarization of the pertinent or important portions of the clinical record and, when filled out it may be used for incorporating the essential data in the health record The completion of this form in duplicate at the ward level permits a corresponding reduction in clerk typist help in the Central Records Office without any detraction from the completeness or adequacy of the health record entry The introduction of the

(2) The Committee on Integration of the Medical Services of the Government was established by the President and was charged with the responsibility of reviewing the medical facilities provided by the various governmental agencies and making recommendations for their improvement such reports and recommendations for legislative action and for changes in administrative policy if necessary This Committee submitted reports May 1946 and specifically recommended That a committee of representatives of the Veterans Administration Army Navy and Public Health Service be appointed to study and make recommendations concerning a uniform system of medical records and statistics

taphones or wire recorders in the ward doctors' offices is saving many professional man hours of work and results in a more complete and readable clinical record than was the case when the physician wrote the entire record in longhand In some hospitals a stenographic unit or general pool is being used whereby the physician picks up a telephone and, unless a red light appears showing the stenographer to be busy, he immediately starts dictating the diagnosis and summary This avoids the tedious writing by the physician and the more tedious reading of some physicians' writing

The Committee has also worked on the development of a standard health record for members of the Armed Services The primary purpose of the health record is to provide a chronologic summary of the health status of members of the Armed Services which will be readily available at any time to the medical officer of the members' command and which, on termination of service, will be readily available to the Veterans Administration for use in the adjudication of claims for pension or disability The Committee has developed 4 forms for use in the health record and these have been approved by the Executive Office of the President and have been submitted to the Government Printing Office for printing The forms are (1) Standard Form 600—Chronological Record of Medical Care (2) Standard Form 601—Immunization Record (3) Standard Form 602—Syphilis Record and (4) Standard Form 603—Dental Record In addition, the Armed Services have developed a standardized health record cover which is of such size, quality and construction that it may be substituted for the medical jacket cover currently in use in the Records Storage Offices In the Navy it is intended also to incorporate as a standard part of the health record the Standard Form 88—Report of Physical Examination, the Standard Form 89—Report of Medical History and a new form, designated as the H 10 for recording on a current basis and in a chronologic order the data on successive outpatient treatments including daily sick-call entries The value of this record in affording the medical officer with an up-to-date medical record on his patient is self-evident, and the probable value of the record to the Veterans Administration at a later date in administering veterans claims will be readily apparent to anyone who has been connected with the difficulty experienced in providing data on sick-call treatments

The clinical record must be a constant reminder of the thoroughness with which the physician has considered his particular patient s case It provides the written record from which there can be checking and rechecking of the various elements in the history, physical examination laboratory tests therapy administered, or even of the degree of training and judgment of the clinician himself It renders unnecessary any reliance on memory alone for

assessing all of the elements of each of these factors which are important in arriving at a considered judgment in a case The record will reveal the symptoms signs, or laboratory results showing any abnormalities, and a check thereof will also reveal whether the clinician has rechecked his results and taken action to confirm or disprove the findings recorded or reported as being abnormal It will show whether (1) necessary consultations were requested without delay (2) consultants gave timely acknowledgment to such requests, (3) full use has been made of the available formulary (4) costly drugs were used with discrimination (5) the effects of such drugs were evaluated constantly and the drugs stopped when they were no longer effective (6) patients were hospitalized unnecessarily, and (7) discharge from the hospital was effected at an appropriate time The clinical record serves as a valuable investigation and research tool and from its proper use we can correlate signs and symptoms of disease and can collect pertinent data of statistical import

In the Navy Form F is used for transmitting data of statistical import to a central office when it is correlated analyzed and published This includes diagnoses, injuries poisonings transfers, disposition of patients, et cetera From this we obtain such important data as incidence rates noneffective rates morbidity statistics, and various other elements of vital statistics

In addition the cross index system of summarizing data from clinical records affords a simple method of assembling series of case histories for study without any extensive personnel force This system is intended to provide ready access to clinical data The basic records in the system are cards for diagnoses, for surgical operations and for special study items The clinician merely sets up his study program and then in closing out each record he marks the data which the librarian is to set off on the index card

Although a detailed and comprehensive record is essential and invaluable in its place it could well be an index of a poor quality of medical treatment under certain circumstances A system for compiling a voluminous and detailed record if introduced in a small institution could well require an excessive number of professional man hours of effort for its operation without providing a compensating degree of data or an improvement in care of the patient The record structure in a teaching institution must necessarily be more elaborate than that in a nonteaching institution a dispensary or an infirmary Under ordinary circumstances it is a waste of professional effort and of man hours to obtain and record a long detailed medical record on an uncomplicated case of common cold of acute tonsillitis or of plantar warts In the exercise of good judgment in the admini tra

tion of the average hospital, the medical record in these simple, uncomplicated and relatively unimportant disabilities should be reduced to those entries necessary for the bare essentials of recordkeeping We would be neglecting a most important aspect of clinical records administration if we failed to consider the ultimate disposition of such records

The problem of storage space for the large volume of clinical records created each year is becoming increasingly acute A recent study in one of the large teaching hospitals revealed that 1,258 pieces of paper were used for record purposes for each bed per year During the calendar year of 1951 a total of 18 783 000 patients were hospitalized Of these, 16 676 000 were short-term patients The clinical records created each year, based on the 1951 short term patient load fill about 41 000 square feet of critical space The cost in personnel filing equipment, and space for the simple task of placing these records in filing cabinets is about $1 500 000

In view of the statutory teaching and research requirements for the retention of these records the space problem as pertains to the continued storage of the records will become more acute with each passing year It is a regrettable fact that the rapid growth of this unrestrained paper monster has, in many instances, forced the hospital records management into the use of sub standard space for the storage of clinical records An inadequate records storage program causes an unnecessary waste of man power in the searches for required case histories and such conditions sometimes result in partial or complete destruction of the records A reasonable solution to the record storage problem is to place the records on microfilm and file the film in unitized cards in numerical or alphabetical system The records will then be readily available Of the original storage space at least 75 percent will have been regained There will be a more efficient use of manpower in storing records, and a sizeable saving will accrue by obviating the cost of purchasing filing equipment

I should now like to mention the forensic medical problem which underscores the importance of the clinical record as an indicator of the quality of medical care The malpractice or alleged malpractice suit or the threat thereof constitutes a serious problem Until 1946, there was no easy way whereby the patient could obtain damages from the Federal Government for acts of negligence on the part of a Government physician In 1946, the 79th Congress enacted Public Law 601 which placed the Federal Government in the same legal status as a civilian defendant At the time the law was passed, it was our impression that the service physicians would frequently become involved directly or indirectly in litigation as a result of the law, and experience appears to have confirmed that view

The law requires that the physician have the learning and skill of other physicians in good standing in the same locality and that he use ordinary care and diligence in the application of such learning and skill As malpractice prophylaxis, the doctor must not only exercise a high quality of medical care, but he should also be able to prove that he has done so His greatest aid in this respect is the clinical record This should show what was done when it was done and it should include a complete recording of all instructions given the patient together with the written history the record of the results of physical examinations and reports of laboratory examinations and the progress notes The physician cannot possibly recall all of these facts after a year or more but the disgruntled patient is likely to remember (not always accurately) every detail and every word spoken It is a common human characteristic to remember only that which we wish to remember and to remember what we have heard not in the context in which it was stated but in the context of how we interpreted it Moreover the patient s vivid recall of the circumstances as he remembers them is liable to sway the average judge or jury when there is a conflict between his and the physician s statements Juries are also apt to conclude and perhaps justifiably that the poor record reflects laxity on the part of the physician and his management of the case

In addition to the necessity for keeping complete and accurate clinical records experience has shown that unexplained alterations should never be made in these records Any alterations in the record are certain to create suspicion unless they are explained dated and initialed Also the altered material should not be obliterated a single line drawn through the change is sufficient The clinical record should show that entries therein were made at or about the time the diagnostic procedures were accomplished Failure to do so may cause the accuracy of the entire record to be questioned It is important to preserve carefully the complete clinical record beyond the time during which malpractice action may be brought which varies from 2 years under the Federal Tort Claims Act to as long as 20 years in some state courts These precautions obviously impose added burdens on the physician and hospital administrator but it is imperative that they be followed by those of us in the field of Federal medicine today if we are to preserve a high standard of professional conduct and avoid costly and damaging lawsuits

PROBLEMS OF THE FLIGHT SURGEON IN KOREA

FREDERICK S SPIEGEL *Major USAF (MC)*

THE problems encountered by flight surgeons in Korea are not greatly different from those elsewhere but certain phases of both aviation medicine and military medicine assume greater importance in a combat theater These problems are enumerated and their significance is discussed in this report

The chief types of Air Force combat aircraft in Korea are fighters, fighter bombers, light bombers, night intruders, and reconnaissance aircraft for weather, day and night photographic, and tactical control missions Each wing has a number of administrative aircraft and trainers, there are helicopters and light aircraft in the rescue squadrons Problems arise and conditions exist in each wing which are peculiar to its mission and to the type of aircraft flown

In Korea a pilot or crew member is "combat experienced" after he has completed a combat tour of duty For fighter pilots and fighter bomber pilots this tour is 100 missions The crews of light bombardment, night intruder, fighter bomber, and weather and night photographic reconnaissance aircraft fly 55 missions These tours usually require 5 to 6 months to complete whereas the assignment of the noncombat crew member is for 1 year The number of hours flown depends upon such factors as the mission, type of aircraft weather, time of day, and fuel and ordnance load, etc Missions vary in duration from 40 or 50 minutes to 4 or 5 hours

The morale of the flying personnel is closely allied with the number and types of its missions The morale of the different organizations is directly related to the activity of the units The busier they are the higher the morale rises until it reaches a point where fatigue sets in, then it drops Morale is dependent upon the number of operational aircraft, the casualty rate the excellence of ground crew support and maintenance, and available recreational facilities One of the best indications of the morale of a tactical squadron is the number of missions which are aborted A secondary but fairly reliable index is the accident

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From 67th Medical Group Presented to the Far East Air Force Medical Symposium Nagoya Japan, 25 September 1952 Major Spiegel was at Larson Air Force Base Washington

rate One of the busiest men in a unit with good morale is the flying safety officer but in a dispirited organization he is the aircraft accident investigating officer

Housing facilities for aircrews generally are satisfactory in Korea The chief types of billets are tents quonset huts, and a few rehabilitated permanent buildings During the summer these billets are hot and humid and it is difficult for night crews to receive adequate rest. In the winter they are heated by either space heaters or stoves which burn diesel fuel The water at most Korean bases is not potable Either boiled or chlorinated water from inspected trailers is used in canteens which are handled only by military personnel A very strict control on chlorination is maintained and the terminal residual chlorine must be at least 5 p p m

Food is well prepared from quartermaster menus and with considerable ingenuity Fresh meat and fresh vegetables or salad are available daily and fresh fruit is obtained frequently Some wings have reported a fairly high incidence of gas pains at altitude and a study has been undertaken to determine the feasibility of special or controlled diets for pilots who fly high altitude missions

Recreational facilities at some bases are very adequate at others grossly inadequate Where good facilities are available the incidence of intoxication and venereal disease has decreased and there is less gambling and delinquency

Hospitalization of most Air Force patients is accomplished in Air Force hospitals Air evacuation of patients expected to be hospitalized in excess of 30 days is accomplished by the 801st Medical Air Evacuation Squadron, which also supplies the airlift for emergency cases Helicopter evacuation of patients to and from our hospitals operates very smoothly One hospital has its own heliport 50 yards from the emergency ward and helicopters come in daily from outlying dispensaries and other hospitals Consultation service from Headquarters Far East Air Forces, is available at all hours and it is not unusual to make such a request and have the consultant arrive the same day

Sanitary facilities and sanitation in Korea generally leave a lot to be desired Insanitary practices that have been followed for scores of generations of Koreans cannot be changed rapidly It is necessary to throw up a protective barrier around our units Tactical commanders are advised of the sanitary conditions of the base by the reports of rigid inspections of dining halls kitchens bakeries ice cream plants water sources latrines barber shops clubs and billets Frequent and regular periodic physical and laboratory examinations of food handlers are required and no indigenous person is permitted in direct contact with any

edibles Supervised bathing is practiced, laundered clothing is furnished, and daily physical inspections are performed by mess supervisors Insect control is rigidly enforced Buildings are regularly sprayed inside and out with residual sprays and aerosol bombs All military personnel sleep under mosquito netting Periodic area aerial spraying is done by C-46 type aircraft All accumulations of water are drained immediately or covered with oil Fire barrels (55 gallon) are treated with 1 cup of 5 percent DDT powder every 30 days Every case of malaria in our units has been traced to faulty antimalaria discipline, i e, irregular or sporadic chloroquine prophylaxis, haphazard use of insect repellent, disregard and disuse of mosquito bar at night, or improper clothing when on duty at night.

A flight surgeon regularly participates in the monthly flying safety meeting program, usually reviewing specific phases of physiology with direct relation to the problems, accidents, or incidents discussed At these wing wide meetings new equipment or procedures are introduced

In aircraft accident investigations, the flight surgeon works closely with the flying safety officer, and his observations and judgment are respected by the accident board He is also a member of the flying evaluation board and is asked to give expert professional advice concerning the psychologic and physiologic qualification or disqualification of the respondent Each squadron flight surgeon is present on the flight line when an emergency arises involving any aircraft or pilot of his unit There is an extremely close relationship built up between air crews and the unit flight surgeon in the combat zone Frequently pilots desire to inspect emergency medical facilities, and it is not uncommon to conduct several through the emergency wards or have them as interested spectators at helicopter evacuations or aircraft rescue practice procedures Most wings have their own individually developed first-aid kits to be used by their own personnel under conditions peculiar only to their mission

The majority of our pilots and navigators are Reserve officers who have been recalled to duty involuntarily The average age of these officers is 31 or 32 years They are more mature men not the eager fly boys they used to be A few are bitter and resentful because they have been sent here These officers are a distracting and a disturbing influence They seek relief from flying duties by various methods, and develop bizarre complaints and excuses The chief excuse is an "incapacitating fear of flying" This situation is difficult to evaluate, but it is decreasing, and has never been a major problem If such a patient presents no demonstrable psychologic or psychiatric disease, he is handled as an administrative problem

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SUMMARY

Not all of the problems of the flight surgeon in Korea are associated with flying but as a doctor he is trained and indoctrinated in all phases of aviation and military medicine His primary mission is to maintain the flying and fighting strength of his unit He must diligently engage in practicing field medicine and surgery sanitation and preventive medicine accident prevention and flying safety promotion, aviation medicine and instruction in aviation physiology he must monitor and assist in the personal equipment program judge morale and assist his commander in maintaining it at a high level supervise and train personnel in all phases of medical service in short he is an advisor in many specialties

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RADIOLOGIC HEALTH TRAINING PROGRAM

A series of courses in radiologic health will be presented by the U S Public Health Service at the Environmental Health Center in Cincinnati Ohio beginning on 5 October 1953 and continuing through 19 February 1954 These courses are designed to provide professional personnel working in health departments and other organizations with a working knowledge of the health hazards associated with radiation Candidates should have a degree in medicine engineering or in one of the physical or biological sciences Courses are two weeks in length and there is no tuition

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The correlation between obesity and serum lipoprotein levels coupled with this demonstration that weight reduction will often lower these serum lipoproteins suggests that in our present state of knowledge the prevention and correction of obesity is the most plausible treatment of atherosclerosis This approach would be strengthened if a positive correlation between the serum lipids and the causation of atherosclerosis were established

—WILDON J WALKER Lt Col MC USA in The Am J Med

CLOSURE OF GRANULATING WOUNDS WITH ADHESIVE STRAPS

AUGUST W SPITTLER *Colonel MC USA*

JOSEPH W BATCH *Colonel MC USA*

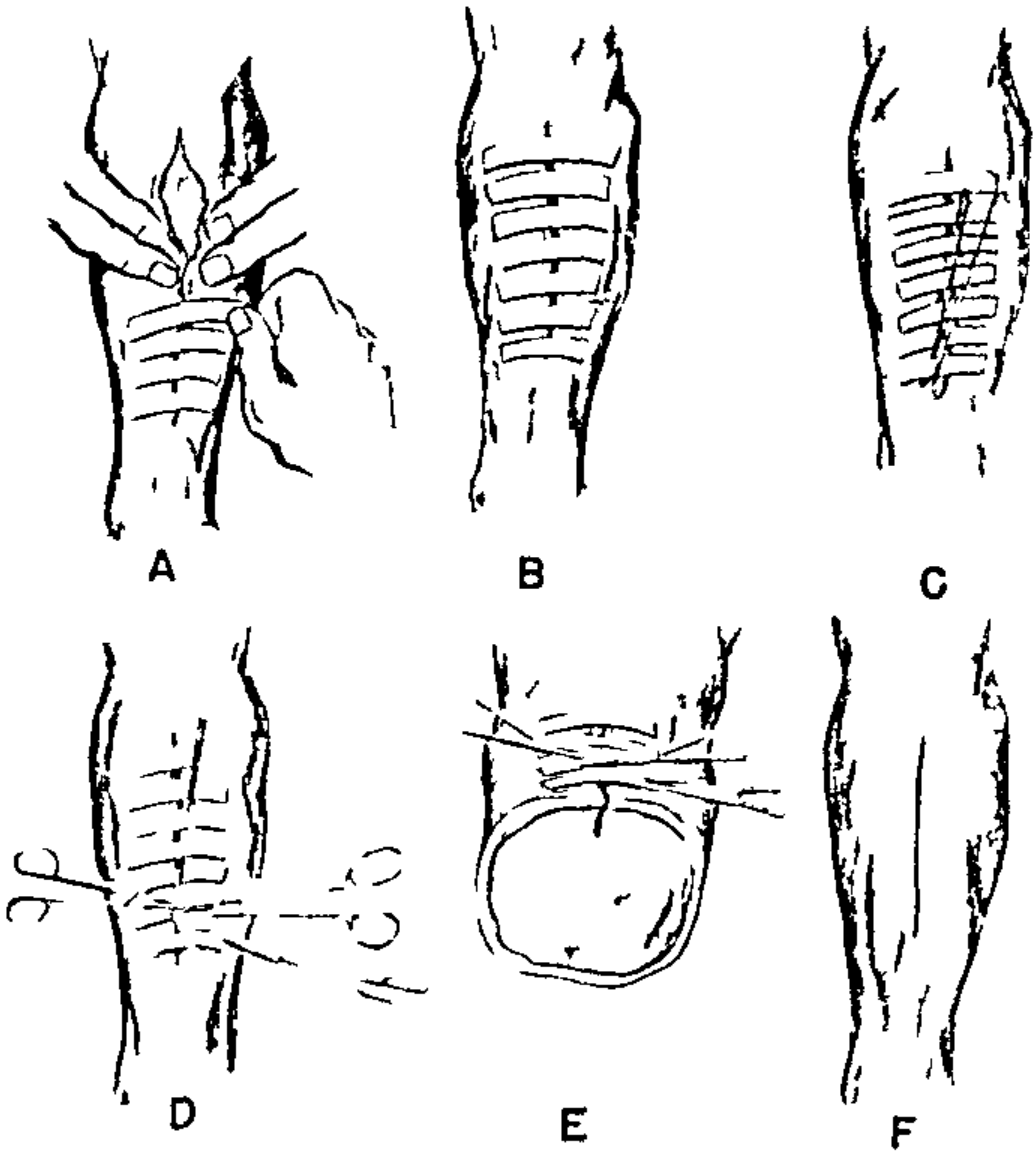
THE conversion of an open wound to a closed wound to prevent reinfection and fibrosis of the underlying tissue has been a long established principle of surgery In the treatment of large and small granulating wounds, the surgical repair is usually performed either by excision of the granulating area, undermining the skin edges, and approximating the skin edges with sutures, or by closure with skin grafts, but there are many occasions when the patient cannot be treated surgically because of his general condition or because of other wounds

Open wounds and defects, even over exposed bone, fill in with granulations which contract down and finally become covered with an immature epithelial covering resulting in a closed wound The large granulating wound surfaces of an open or guillotine amputation can be made to close over by the application of constant skin traction This principle to close a wound may be employed on the surfaces of extremities or other parts of the body surface by applying a horizontal pull on the skin with adhesive strips For many years adhesive tape cut in the pattern of a "butterfly" has been used, but not extensively, to prevent wound dehiscence or to approximate and hold wound edges together when sutures failed to do so for some reason or have been removed prematurely The use of adhesive tape as a definitive or primary method of closing granulating wounds was advocated and practiced by Keller for many years with amazing results even in the days before antibiotic therapy With antibiotics to control infection and enzymes to reduce fibrosis, it occurred to us that the method deserved a retrial, particularly in those patients where previous surgical closure had failed because of tension

In 1950, when a number of Korean casualties arrived at this hospital with multiple, clean, granulating wounds and other wounds or injuries or a full operating schedule prevented surgical care immediately the method was tried It soon became apparent

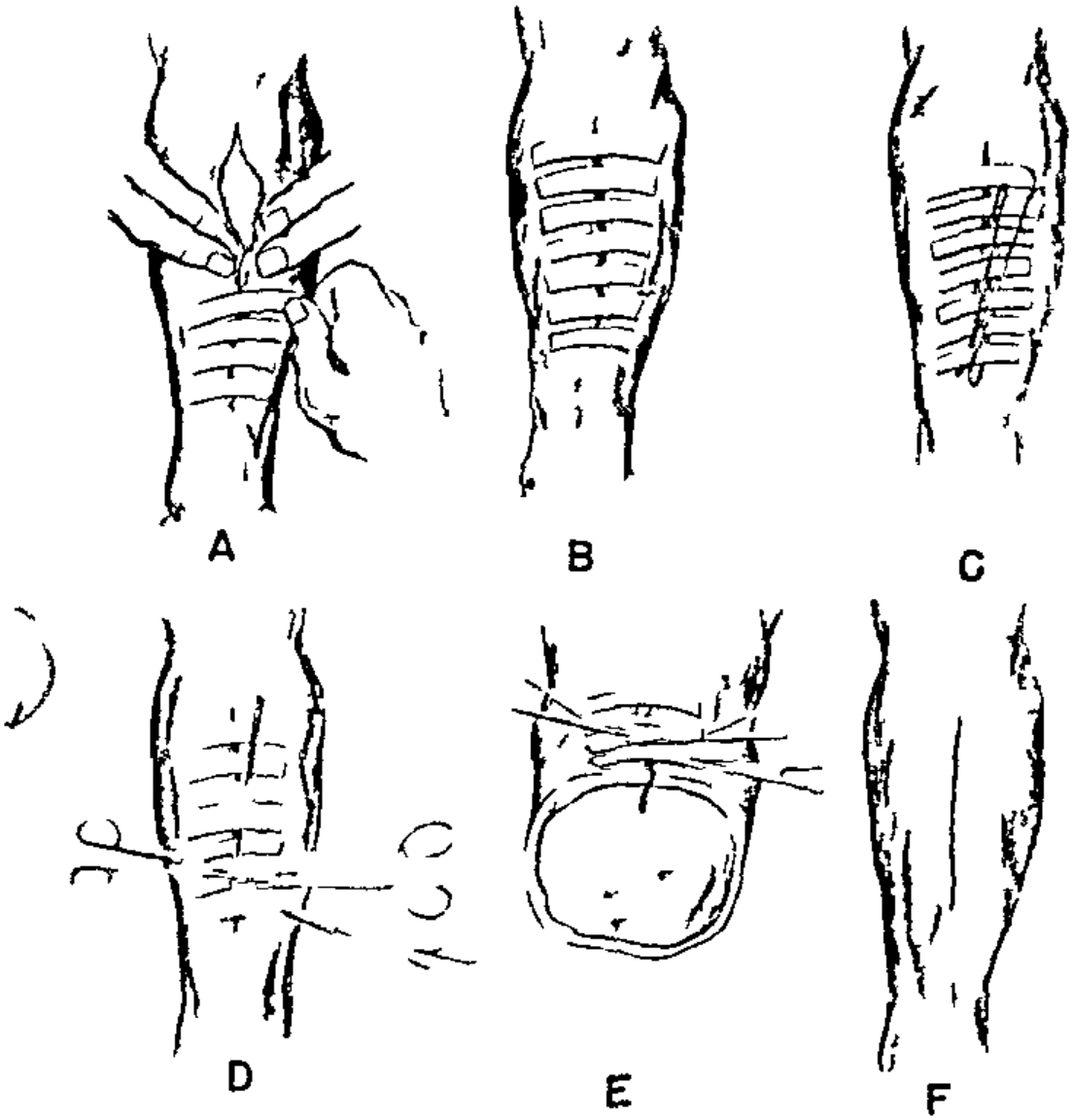
From Walter Reed Army Hospital Washington DC

that it was a treatment of merit, and many wounds were completely healed before they could be scheduled for definitive surgery In other instances to obtain a satisfactory closure the magnitude of the surgery was greatly reduced Several hundred wounds have now been treated by this method with gratifying results and we believe that it has a definite place as a method of treatment We continue to use it both as an interim as well as a definitive method of obtaining closure of granulating wounds in selected patients



Figu l (A) The ti l appl at of adhe ve tap w th appr x mat f k dg (B) St p f adhe e t p pla (C) C tt g f adhes e t ip l g d ma g (D) R plac me t f l adhe tap t ppl g u th add t nal t pp g (E) C os ct of (D) l g how nd dg a app ox mat d by tra t n. (F) The heal d u nd

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TECHNIC

Thorough wound hygiene is first accompli
agents such as hydrogen peroxide or deterge
d bris is digested and removed by the applica
trip in every 3 hours for several days App
therapy systemically or in conjunction wit
therapy is maintained

The skin around the wound is painted with
of benzoin or other adhesive agent The ski
together and held by an assistant while strips
1/4 in width from 1/4 to 1 inch, are placed
wound and across the wound, in the desired
and firmly attached on the opposite side (fig 1A
trips are placed at 1/4 inch intervals along
of the wound (fig 1B) Care must be exercised
e circle an extremity or the skin margin will not toward
the center of the ulcer Sterile dressings are applied over the
taped wound



Figure 2 An amputation stump of the right leg during the course of adhesive tape stapping of a wound which initially was 2½ inches wide and 12 inches long with the shaft of the tibia exposed

In 24 hours the skin will have relaxed, the adhesive across the ulcer loosened and the defect will be smaller The adhesive must then be reapplied to maintain traction on the skin The adhesive strips are not completely removed, but only that portion overlying the wound proper is cut out with sterile scissors without allowing the edges to retract even momentarily (fig 1C) An assistant with two forceps grasps each cut end of the adhesive strip and maintains traction in the direction of pull while a new strip is placed over the old one across the wound or ulcer (figs 1D and 1E) Each strip is replaced in turn in a similar manner External dressings are changed as indicated for wound cleanliness or enzymatic treatment and adhesive strips are adjusted daily until wound healing takes place (fig 1F)

DISCUSSION

Most wounds can be closed in from 2 to 6 weeks by this method In many instances no further surgical correction need be performed on the resultant scar Large wounds closed in this manner may require a scarplasty to convert a resultant adherent scar to a smooth pliable surface In large wounds of the extremity the resultant contouring effect of this closure is often better than when skin grafts are used (figs 2 and 3) By employing this method of wound closure in selected patients operating room time will be conserved and patients will be given fewer anesthetics

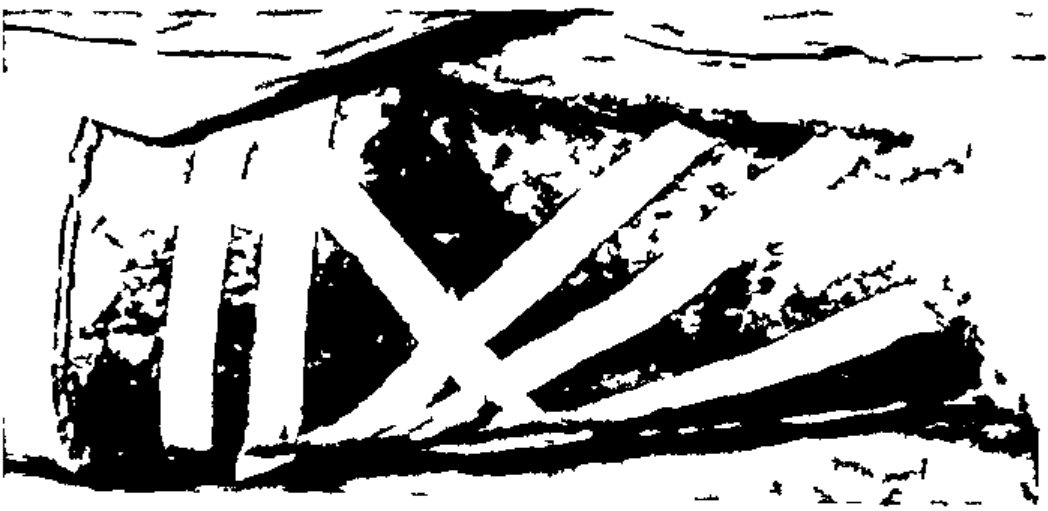


Figure 3 A large irregular broad granulating wound of the posterior surface of the right leg which is being approximated with adhesive strapping material

CONCLUSIONS

Granulating wounds even large ones may be closed without surgical intervention by the use of adhesive tape to obtain skin traction in the desired direction Many wounds heal with small scars which may not require other surgical correction The magnitude of the surgical procedure is reduced in those still requiring an operation

SCAPULA RETRACTOR

ROBERT M HARDAWAY III *Lieutenant Colonel MC USA*

DONALD W CLAYBORNE

WHEN a thoracotomy is performed through a rib higher than the seventh, it is necessary to retract the scapula upward to expose the rib to be resected For instance, in pneumonectomy the fifth rib is commonly resected requiring that the tip of the scapula be retracted upward from the fourth to the fourth rib An intern can hold a retractor but it is a

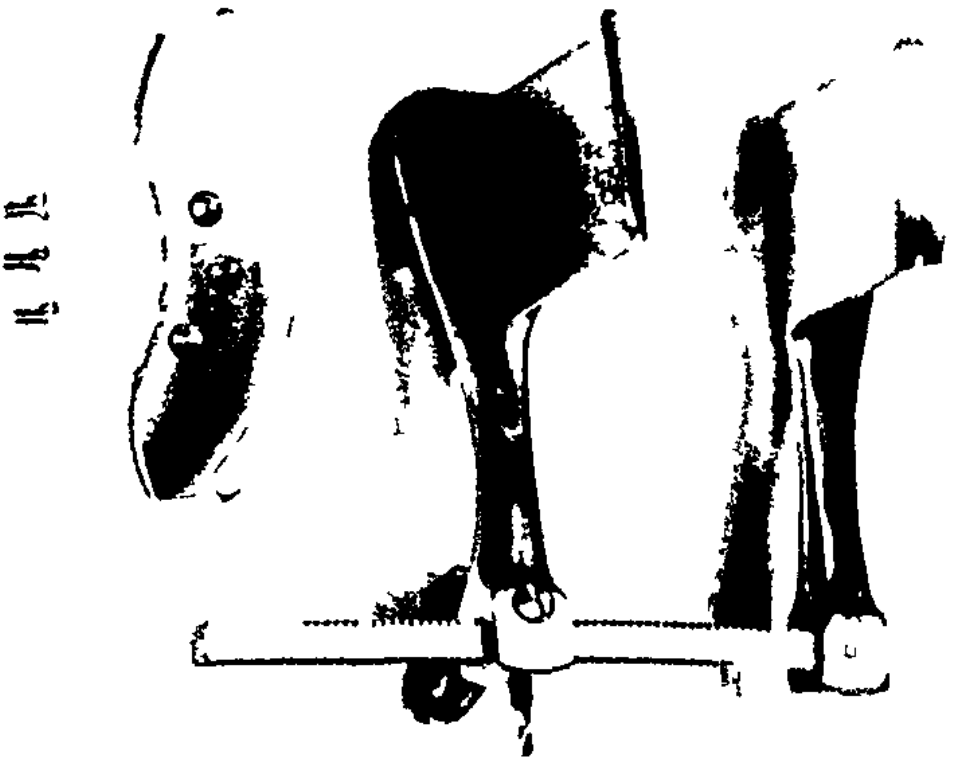
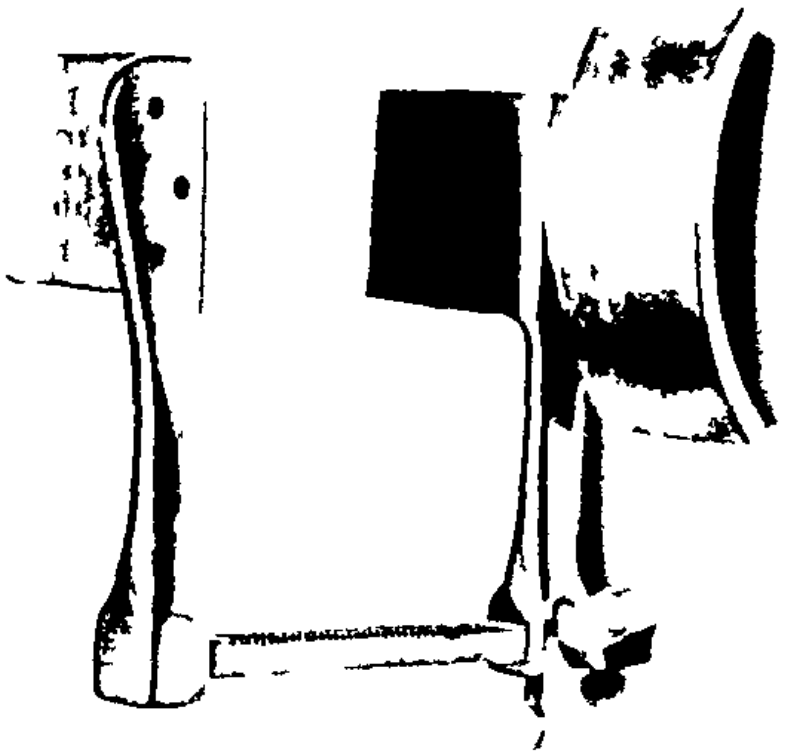


Figure 1 Retractor and scapula retracted attached

fatiguing assignment which immobilizes the assistant The scapula may be retracted by having a blade on the self retaining rib retractor sufficiently long to include both the scapula and upper rib The standard rib retractor (3 1/2 Flo Retractor Company rib, self retaining Tuffier) has two identical blades which are not long enough to hold the scapula An attachment for the retractor was constructed by the Ordnance Section at

From the U S Army Hospital Fort Benning Georgia



F gur 2 R b t ctor th ap la t actor atta hed



I g 3 S ap la t actor

Engineer Center Fort Belvoir Va from an aluminum piston of a diesel engine (fig 1 3) This can be easily attached to the tandard rib retract r when retraction of the scapula is neces ary For operation belo the seventh rib it can be removed

THROMBOANGIITIS OBLITERANS IN WOMEN

VERNON M SMITH *Captain MC USA (1)*
MARVIN M MOSER *Captain, USAF (MC) (1)*
ANDREW G PRANDONI *M D (2)*
PAUL S FANCHER *Colonel MC USA (1)*

THROMBOANGIITIS obliterans is rarely encountered in women Only 60 instances have been reported *(3 25)* The incidence of thromboangiitis obliterans in women may be higher than this indicates because many cases are probably not recognized as such The diagnosis was proved by histologic study in 9 of the 60 women *(3 8)* The clinical diagnosis was questioned in the others by Horton and Brown *(7)* and in 11 of the e *(7 10 13 16 20 22)* by Silbert *(18)* In the patient reported by Trabaud and Chaty *(21)*, recurrent jaundice, gangrene

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(1) W lt r R d Army Hospital W hingt D C
(2) Ci ili n C nsult nt P ripheral V scular Clinic W lt r R ed Army H p tal W hingt n D C

(3) Atlas L N Ca of B rger diseas i ld woman Am H rt J 26 120-123 July 1943
(4) Da is H A nd King L D Comparat v tudy of thromboa giitis obl t rans in wh t nd N gr patients Surg Gyn & Ob t 85 597-603 N v 1947
(5) Fi her R L Z k rman M nd Sw ny D N J Thr mbo-ang tis obl t rans in w m report f ca e A gi logy 2 132 137 Apr 1951
(6) Frank N Thr mboangi it oblit rans wom n revi w nd r port f prov d cas J M Soc N J rsey 49 26-28 Jan 1952
(7) Hort n B T nd Brown G E Thr mbo-ang tis oblit rans m ng w me Arch Int Med 50 884-907 D c 1932
(8) M l ey F L nd Miller G G Thr mbo ng t s oblit ra A Surg 81 976-993 May 1925
(9) B rg r L Th Circulatory D sturba s f th E trem ti W B S und rs C Ph l d lphia P 1924
(10) Durck H D e g na t Thromboa gi t obl t r im R hme d r in f kti to sch n Gef s trund ng V rhandl d d ut ch path Ge llsch 25 272 291 1930
(11) Hammar tr m E Thrombo-a g itis bl t ra s (B rg r s d as) gangre f xtr mities a d of lo p of mall t t n d p rtal thr mbo is woma Sv nska l k. tidning 36 1565-1572 Aug 25 1939
(12) H rr ll W E nd Alle E V Thr mbo- g t oblit r s in wom r port of ca Am H art J 12 105-108 July 1936
(13) K y K Thr mbo-a g t obl terans Acta sch l med u iv imp Kioto 4 489-510 Apr 1922 (in Engli h)
(14) L F vr F A d Bur J Thromboangiitis blit r in wom n r port of two ca s Cle la d Clin Quart 11 49-52 Ap 1944
(15) M llma S Thr mboa g ti blit ra in w ma rep rt of c Am H rt J 15 746-748 Ju 1938

of digits, ear, nose sacrum, heels trochanters, and elbows and terminal coma are somewhat suggestive of thrombotic thrombocytopenic purpura *(26 30)* although an exact diagnosis is not possible from the data given Early conclusions regarding the limitation of thromboangiitis obliterans to young Jewish men have been modified by reports of its occurrence in the aged *(3 7)* in women *(3 95)* and in Negroes *(4 31 32)* Criteria for the diagnosis of thromboangiitis obliterans in the absence of histologic evidence were outlined by Allen et al *(33)* and others as follows (1) the presence of occlusive vascular disease, (2) onset before the age of 40 years, (3) the presence of or adequate history of superficial thrombophlebitis (4) involvement of both upper and lower extremities and (5) the absence of lipomia and diabetes mellitus Although not all proved instances of the disease meet these criteria, they are of aid in clinically establishing the diagnosis

(16) R bi S K Th mboang ti bl t ra i w ma w h me op l yn dr m M R 149 223 224 Apr 5 1939
(17) S id nat l H U usual p iph l va l r di i w ma (th mbo- g it bl rans?) B ll H p J l t D 3 73-75 Ap 1942
(18) S lbert S Thr mbo- gilti bli ra i w me port f 2 A Surg 10 324 328 J 1935
(19) S lbert S Furth pe w th thr mb gilti bli er i w m Am. H rt J 36 757 771 N 1948
(20) T lford E D d S pf d J S B Tw f thrombo-a g it bl t ra i w m B it M J 1 1140-1141 J 25 1927
(21) Traba d J d Chaty C Etud m cros p q d lé d ca d malad d L B g r h f mm m lma B ll t m m Soc m d d h p d P 47 583 584 Ap 6 1931
(22) Trabaud J nd Mredd Mal d d L B g r ch f ll mus lma B ll m m So m d d h p d P 47 579-583 Ap 6 1931
(23) V Dell T R d W ght I S Thromb g ti bl t ra in w men por f Am H rt J 13 373-375 Mar 1937
(24) Wil ky N D d C ll W S Thr mbo-a g is bl in f J A M A 110 1745-1747 *May 21 1938*
(25) W ll m W S nd B k N W Th mbo-a g it bl t m g wo port f 2 s P Staff M May Cl 21 55-58 F b 6 1946
(26) M h witz E A te f bril pl iochr m c mia wi h by l thr mbo i f te minal rt l l d pilla Ar h l t M d 36 89-93 J ly 1925
(27) S g t K Mo l ky A G nd Sha be g J N Thr mboti thr mbocyt pe l purpur tud h m lyt yndr m l this d Bl od 5 434-448 May 1950
(28) B tg lm P M Var s f pla l thr mbo is y dr m nd th ir la l- h p t di em nat d l pus Arch P th. 51 213-223 F b 1951
(29) M ham G C Orb J L H J R W S J H. J nd Scha f J A Thromboti thr mbocyt pe purpur d minat d d f rt i l Blood 6. 706-719 A g 1951
(30) M ham G C Orb J L d H nl R W Thr mboti thr mbocyt peni purpur bs rvati ur nd path g J L b & Cli M d 36 964 965 D 1950
(31) W haw ky H Thrombo-a g i is bl t r N gr t p rt f M B ll V t. Admi 18 83-85 J ly 1941
(32) Y ter W M Thr mbos gii blit ra h g oe port f 5 rudi d art t graphi lly nd pa h l g lly Am H rt J 13 511 533 May 1937
(33) All E V Ba k N W nd H ne E A J P ph ral V cul r Dis- W B Saund rs Co Ph l d lphia P 1946

Recently, in this clinic, a woman was observed to have organic involvement of the peripheral vessels of her upper and lower extremities for which several of the newer vasodilating agents were given The findings satisfied the clinical criteria for the diagnosis of thromboangiitis obliterans

CASE REPORT

A 33 year old white woman, a heavy smoker, of Dutch English extraction, developed thrombophlebitis of her right foot in 1944 which subsided after 3 weeks of conservative therapy Following minor trauma, recurrences of thrombophlebitis occurred in her right leg in 1946 and in her left leg in 1948 In October 1949, a tennis ball struck the tip of her left middle finger A paronychia developed, resulted in partial loss of the digital pad, and required 3 months to heal In February 1950, following a long, cold automobile ride, the patient developed severe burning pain, numoness, swelling, tenderness, and mottling of the toes of her left foot These symptoms subsided partially but later returned and grew worse In addition, after walking 1 or 2 blocks at a moderate pace, she noticed pain in her left calf and foot The toes of her left foot became cyanotic and on the appearance of ulceration of the toes, she sought medical aid and was admitted to this hospital in May

TABLE 1 *Skin temperature and oscillometric readings*

	Right foot	Right ankle	Left foot	Left ankle
Average skin temperature (C) of toes and plantar surface	29 9		28 7	
Oscillometric readings	0 25	1	0	0 38

She had smoked 2 packs of cigarettes daily for 13 years Her alcohol intake was moderate There was no history of previous illness or the use of drugs A grandmother died of heart disease manifested by angina pectoris There was no other history of vascular disease in the family

The toes of the left foot were cooler to touch than those of the right foot There was redness, swelling, and marked tenderness in the first 3 toes of the left foot with blackened ulceration on the medial surface of the distal phalanx of the first toe A yellow brown crusting exudate oozed from beneath the nails of the second and third toes The popliteal and posterior tibial pulses were present in the right leg but were absent in the left. The radial, brachial and femoral pulses were normal The ulnar pulses were absent and the Allen test *(33)*, which was positive bilaterally, indicated decreased ulnar arterial flow Elevation of

the lower extremities produced marked blanching and dependency produced rubor of the feet which was more pronounced in the left foot Skin temperature and oscillometric studies at a room temperature (28 C) are shown in table 1 Following standard exercise (40 ascents over two 9 inch steps) the oscillometric readings of the right ankle increased from 1 5 to 1 75, a normal response on the left, it decreased from 0 5 to a trace which is considered by Prandoni et al *(34)* to be suggestive of organic vascular disease An exercise tolerance test of the upper extremities (50 flexions of the hands) produced oscillometric changes of the right wrist from 1 25 to 1 5 and of the left wrist from 1 to 1 5 normal responses A left lumbar sympathetic block by procaine injection produced an increased skin temperature of the left calf and ankle but none in the foot

TABLE 2 Skin temperature and oscillometric readings

	Right	Left
Average skin temperature (C) first third and fifth		
Toe	29 9	25 5
Ar g	31 1	
Oscillometer readings		
Foot	0 25	0
Ankle	1	0

The patient was instructed to stop smoking Fifty milligrams of benzazoline (priscoline) was injected into her left femoral artery once or twice daily and 200 mg was given daily by mouth The intra arterial injection of benzazoline occasionally resulted in an exacerbation of pain in the toes which lasted about 2 hours and was accompanied by increased warmth of the foot Whisky sedation whirlpool baths bland soaks, and antibiotics were also used

This regimen of therapy was accompanied by moderate subjective relief with some improvement in the appearance of the toes After 4 or 5 weeks several of the toenails were removed The patient was given 60 mg of phentolamine 3 times daily with an equivocal response and 10 mg of hydralazine hydrochloride by intramuscular injection twice daily Occasional headache accompanied the latter medication but definite skin temperature rise followed each dose The cyanosis of the left toes decreased but evidence of chronic infection persisted and

(34) Prandoni A Ortiz J A Gilfillan M P Rehabilitation

TABLE 3 *Exercise tolerance test*

	Oscillometric readings		
	Before	Immediately after	Three minutes after
Ankle right	2 5	4	3
Ankle left	1 5	0 5	1 5
Foot right	1		
Foot left	trace		

40 steps (equal t do le the standard Mast r s test)

after 3 months spontaneous drainage occurred from the left third toe A culture revealed the presence of penicillin sensitive *Micrococcus pyogenes* var *albus* After appropriate antibiotic therapy, progressive ambulation was well tolerated The patient was discharged from the hospital and given maintenance doses of benzazoline, hydralazine hydrochloride, and aureomycin A week later she developed abdominal pain, icterus, clay colored stools, and dark brown urine She was readmitted to the hospital with a diagnosis of acute hepatitis confirmed by needle biopsy of the liver Her illness was complicated by a right pyelonephri tis, severe ascites, and hepatic coma By January 1951, she showed definite improvement During sick leave in April, she had an episode of coldness, pain, and blanching of her left foot while flying at a high altitude Examination several weeks later revealed deformity of her left third toenail, blanching on elevation

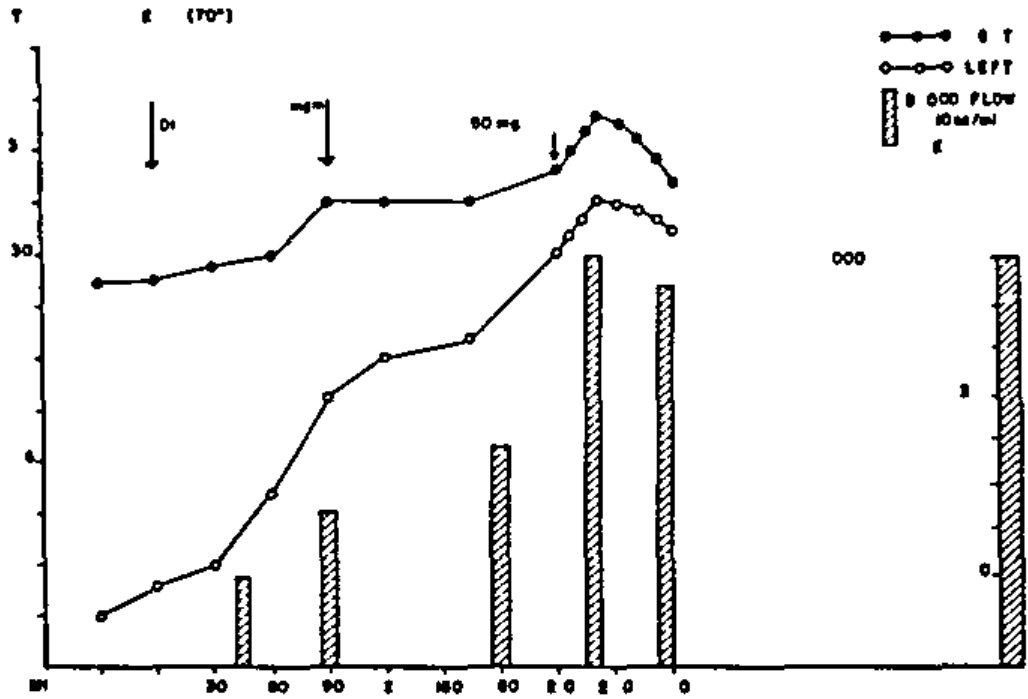
TABLE 4 *Cold oom skin tempe ature study*

	Room temperature		
	28 2 C	15 6 C	27 6 C
Right foot	33 5	18 5	25 5
Right hand	34 1	20 7	31 6
Left foot	30 7	18 8	25 2
Left hand	33 1	24 6	31 7

Av rag temperatur (C) f fir t third d fifth d gits

of her feet and a rubor on dependency which was more pronounced in her left foot Walking more than 5 blocks at a mod erate pace resulted in pain and tenderness in the proximal por tion of her left foot and some soreness in her calf

She was released from the hospital in June and advised to live in a warm climate In the ensuing 6 months she continued to smoke cigarettes and intermittent claudication persisted in spite of light activity In January 1952 her fingers and toes were warm to the touch and no rubor or blanching of her hands or feet was present Her skin temperature and oscillometric readings



Figur 1 Ski t mper ture d blood flow po t d b yl by mo th a d b meth l m br mid l trave sly

at that time are shown in table 2 Venous filling time was only slightly delayed There was no ulceration or edema Electronic oscillometric studies *(35)* revealed slightly decreased resting pulsations of the right lower extremity and definitely decreased pulsations on the left An exercise tolerance test revealed a normal response on the right and an abnormal response on the left (table 3) A slightly increased vasoconstrictor response to cold in the lower extremities followed a 20-minute exposure to a temperature of 15 C (table 4) Blood flow studies (fig 1), using the venous occlusion plethysmograph *(36)* and the vasodilating agents dibenzyline *(37)* and hexamethonium bromide *(38)* re

(35) K E nd H h J B El ctr ill m A gi l gy 1 391 395 Oct. 1950

(36) Bur h G E N w l i portabl plethy m graph Am H t J 33 49-75 J 1947

(37) Mos M W k D Mor N nd Mattingly T W *Eff* ct f d benzyl k t mperatur pe ph ral blood flow nd m tor po i ormal pa i nd p ti w th i er d oc tri tor U p bl h d da

(38) J hns n R I F E D d Schnape H W H modynami ha g in mall l ma nalyz d by d g tal pl thysm gr phy A g logy 2 412-422 Oct 1951

vealed an increase in skin temperature and blood flow response on the right lower extremity which closely paralleled responses observed in normal persons On the left, however, the maximum skin temperature was 30 5 C and the blood flow response was only two thirds of that observed in normal patients in this laboratory, indicating the inability to achieve maximal vasodilatation, that is, the presence of organic occlusive vascular disease

Two biopsies in the region of the left gastrocnemius muscle failed to reveal evidence of vascular disease The patient's clinical status rendered biopsy of her posterior tibial artery inadvisable Several attacks of superficial thrombophlebitis were observed in the course of her hospitalization A right nephrectomy was performed to remove the chronically infected kidney and pathologic sections of it did not show any vascular disease The oral administration of dibenzyline was accompanied by some increase in the temperature of the left foot and a decrease in sweating, but intermittent claudication continued The persistence of symptoms and failure of the patient to stop smoking necessitated her separation from the military service

DISCUSSION

This patient's clinical signs and symptoms, together with extensive investigation of blood flow response to the administration of various vasodilating agents, established the existence of organic vascular disease In addition, abnormal vasoconstrictor activity was demonstrated The patient presented classical signs and symptoms of thromboangiitis obliterans including recurrent migrating thrombophlebitis without apparent cause, clinical evidence of upper and lower extremity involvement, and absence of evidence of arteriosclerosis Despite 2 negative biopsies, a clinical diagnosis of thromboangiitis obliterans appears to be valid in this instance

Why this disease tends to occur predominantly in men has not been established The role of sensitivity to tobacco in the pathogenesis of the disease has been discussed *(9 39 41)* Silbert *(19)* reported an increase in the incidence of thromboangiitis obliterans in women from 1 percent in his first 1 000 to 4 percent in his next 600 cases He ascribed this to the increased consumption of tobacco by women The patient presented here was a heavy smoker and the continued progression of her disease was considered to be related to her inability to refrain from smoking

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(39) M y r W E l gy f t romboangiiti bl terans (Buerger) J A M. A 71 1268-1272 Oct 19 1918

(40) B rk J W T bacc f ctor thr mbo- gi t blit ns Proc Staff Me t Mayo Clin. 6 65-68 F b 4 1931

(41) S lb rt S. Et l gy f thr mboa g t bl t ra J A M. A 129 5-7 Sept 1 1945

The withdrawal of tobacco is important in the treatment of thromboangiitis obliterans Mild cases often respond to cessation of smoking alone Others require a full therapeutic regimen, including exercises reflex vasodilatation by the distal application of heat, vasodilating agents (oral intravenous, intra arterial) the rocking bed intermittent venous occlusion apparatus and sympathectomy Therapy is directed toward the release of vasoconstrictor tone but the benefit to be derived from this release is limited by the amount of unyielding organic occlusion already present Thus sympathectomy has not proved of significant value in the patients studied at this clinic, except for those characterized by a severe degree of vasoconstrictor tone and minimal organic involvement In patients selected for sympathectomy partial relief of pain has resulted The patient presented here had a high degree of vasoconstrictor tone with organic vascular involvement of moderate severity especially in the left leg Although hexamethonium bromide and dibenzyline effected release of vascular tone maximal blood flow was not obtained and intermittent claudication persisted

SUMMARY

Thromboangiitis obliterans in women is a clinical rarity Of 60 instances reported in the literature, only 9 have been proved by histologic study The diagnosis based on clinical findings appears warranted in 40 additional cases

A woman was found to have organic vascular disease which met the established criteria for the clinical diagnosis of thromboangiitis obliterans Evaluation of this patient s condition by the use of several of the newer vasodilating agents indicated the presence of a high degree of vasoconstrictor tone and a moderate degree of organic involvement Intolerance to tobacco and inability to refrain from smoking were considered important in the development and progression of her disease An increasing number of women with thromboangiitis obliterans may be encountered in the future because so many women are now smokers

Therapy for this patient was directed toward cessation of smoking and release of increased vasoconstrictor tone Although effective release of vasoconstrictor tone was accomplished by various means the unyielding organic occlusion already present together with continued smoking prevented a satisfactory result.

RADIOLOGIC CLEARING IN SUBACUTE MASTOIDITIS TREATED WITH ANTIBIOTICS[1]

EMANUEL J SOBIESKI M D

ROBERT E WAUD *Captain MC USA*

N our survey of the literature we found that most articles on the radiologic findings in mastoiditis were concerned with diagnosis and prognosis Radiologic evidence of healing healed mastoiditis is seldom mentioned in the literature prob y because roentgenograms were obtained only as a preliminary uirement to surgical intervention in acute or chronic mas ditis

Of healed mastoiditis Graham Hodgson *(2)* stated, "If the in tion has been of sufficient severity and duration, the radio- m will show abnormal density of the middle ear on the affected le The ossicles may or may not be visible, and the bony walls the middle ear, the petrous bone and the mastoid process, will ow a varying degree of sclerosing osteoitis If the process is llular, some or all of the cells may be completely obliterated sclerosis of the walls, and the visible cells may be cloudy, e to granulations and chronic hyperplasia of the mucosa Where superimposed acute infection occurs in such a mastoid it is equently impossible to detect it radiologically "

The majority of the articles on mastoiditis belong to the era be re the introduction of antibiotics when the treatment of chronic subacute otitis or, better otomastoiditis was essentially cal, consisting of irrigation of the accessible cavity with erile saline or antiseptic solutions or placing hydrogen perox e or a saturated alcoholic solution of boric acid or other anti ptic solutions in the external auditory canal The pus was ained slowly through the antrum and tympanic membrane If a olesteatoma did not form, healing was produced by slow sclerosis of the mastoid Mayer *(3)* stated that the increased denseness is a characteristic sign of repair

(1) U S Army H sp tal Camp S ma Calif

(2) Graham-H dgs H R d l gy f inf d mporal b Proc Roy Soc M d 43 989-998 D 1950

(3) May E C Or l gis h R g diag t k (B d II) H lzk ht G (d t s) H dbuch d th h und kl h (llg me d p ell) R n ge kund Jul s Sp g B l 1930

286339 O 53 7

The diagnosis of recovery was based on the purulent discharge stopping the nonrecurrence of removed polyps and closure of the perforation in the eardrum (not very common) The antibiotics presented the possibility of a systemic attack on the bacteria not only of acute but also of subacute and chronic otomastoiditis

We have observed 2 patients with subacute mastoiditis treated with antibiotics who showed healing not only clinically but also radiologically The diagnosis of subacute mastoiditis was made because neither patient gave a history of earache in childhood and the pneumatization of the mastoid bone was of the large cell type The diagnosis of acute mastoiditis could not be made even though one patient developed slight pain and tenderness over the mastoid region and the other patient had no pain, fever or leukocytosis and the only clinical findings were those of a purulent discharge and a large marginal perforation of the tympanic membrane

CASE REPORTS

Case 1 A 23 year old man was first seen in the E N T clinic on 18 August 1950 He had had no previous attacks of otitis media In April, while at another station, he was kicked in the right ear A severe earache developed which was relieved on the second day when a discharge began from the ear He reported to the dispensary and was treated with penicillin and an assortment of pills He was ordered to this station in July The discharge from his ear continued but pain was intermittent On examination he had a seropurulent discharge from the right ear and a perforation of the tympanic membrane at its posterior margin His hearing for low conversational voice on the right was 0/15 left 15/15 for whispered voice on the right was 0/15 left 15/15

A diagnosis of chronic suppurative otitis media was made and he was given 250 mg of terramycin in capsules 3 times a day 600 000 units of penicillin intramuscularly daily for 5 days, alcohol and boric acid drops in the ear and phenylephrine hydrochloride nose drops

On 25 August he was seen by one of us (E S J) At that time he complained of pain in the right ear Examination revealed a mucous discharge No perforation could be seen The walls of the auditory canal were swollen and a furuncle of the canal was noted Penicillin ointment for the ear was prescribed On 29 August the furuncle was much improved No discharge was present but soreness around the ear and tenderness of the entire mastoid area were present especially at the apex He was again given 600 000 units of penicillin daily His leukocyte count was 9 300 with a normal differential count. The roentgenogram of the

mastoids revealed the left mastoid to be of the mixed cell type and to appear normal The right mastoid was of the mixed cell type and showed moderate uniform clouding (fig 1) A diagnosis of acute mastoiditis was made Pain and tenderness of the mastoid region continued and the patient was admitted to the hospital on 11 September



Figure 1 (case 1 29 August 1952) The left mastoid (L) *is normal The right mastoid* (R) *shows uniform clouding consistent with an acute or subacute mastoiditis*

Because penicillin and terramycin had been prescribed prior to the patient's coming under our care and a favorable response had been obtained, and because no bacteriologic study had been made before this therapy was instituted, it was considered best to continue with it The pain was relieved but the tenderness of the entire mastoid area persisted On 16 September whispered voice was heard on the right The tympanic membrane was in normal position The leukocyte count was 7,100 with a normal differential count Roentgenograms showed a decrease in the clouding of the right mastoid

On 19 September the patient complained of dizziness Despite the fact that vestibular phenomena have not been reported with terramycin, it was discontinued Tests for vestibular damage, including the Bárány test, were negative for both sides On 23 September the patient had had no recurrence of dizziness Terramycin was again given By 29 September there was no tenderness of the mastoid region There had been no further dizziness Roentgenograms showed slight residual clouding of the right mastoid region (fig 2)

On 1 October whispered voice was 15/15 in both ears, the audiogram was normal in both ears, and the patient was discharged to full duty

Comment In spite of closing of the perforation in the tympanic membrane the infection continued and developed in the mastoid bone This possibility was pointed out by Diamant and Lilja (4) who stated in a number of cases it seems that any infection can remain and progress in the cell system despite the fact that the middle ear and the tympanic membrane show completely normal conditions This patient s progress could be followed by decrease of pain improved hearing decreased leukocyto count and changes on the roentgenograms Apparently antibiotic therapy in high dosage brought about healing in the type of case in which previously a mastoidectomy would have been required



Figure 2 (Case 1 29 Sept mb 1952) Comparative roentgenograms of the left and the right mastoid bodies showing

Case 2 A 23 year old soldier was first seen in the E N T clinic on 29 October 1952 He had had a left acute otitis media in 1944 In July 1952 a purulent discharge from the left ear began It stopped spontaneously during August but began again in September and continued

On examination there was a purulent discharge from the left ear The tympanic membrane was destroyed posteroinferiorly and the remaining part was adherent to the promontory The whispered voice hearing was 5/15 on the left Culture of the aural discharge was made to determine the type of organism present as well as its antibiotic sensitivity Only local treatment with sodium borate and hydrogen peroxide was given while awaiting the results of the laboratory tests

(4) Diamant M and Lilja B Chronic mastoiditis Acta radiol 29 37 56 1948

On 27 October the ear was still discharging The culture contained streptococci and staphylococci which were sensitive only to streptomycin The leukocyte count was 3,900 and the differential count was normal Roentgenograms taken on 22 October revealed the right mastoid to be normal but the left mastoid appeared to be sclerosed except for the tip where several small aerated cells were seen (fig 3)

The patient was admitted to the hospital and 1 gram of streptomycin was given intramuscularly daily in divided doses On 31 October the discharge was more liquid and mucopurulent On 3

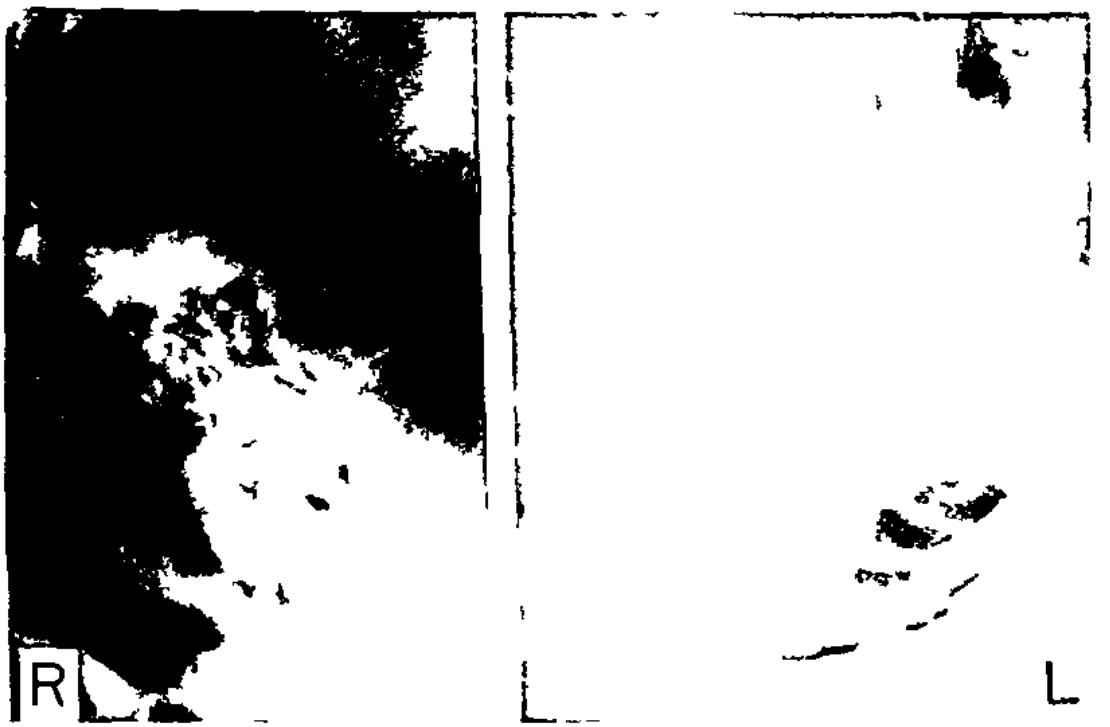


Figure 3 (case 2 22 October 1952) The right mastoid is normal The left mastoid appea s sclerose l

November the discharge was very slight The leukocyte count was 4,900 with 54 percent neutrophils, 44 percent lymphocytes, 1 per cent monocytes and 1 percent basophils

Roentgenograms still showed dense clouding of the left mas toid but some peripheral cells were visible Local treatment was started on 12 November The attic of the auditory canal was irrigated with sterile saline solution and some clots of puru lent material were obtained The patient was then placed in the right lateral position and the left ear filled with a 10 percent solution of streptomycin Using a bulb syringe, negative then positive pressure was applied, as described by Reid *(5)* and by

(5) R id W O T tm t f t h ea by rgyr l d plac m t B t M J 2 1271 1272 Dec 30 1939

one of us *(f)* During this procedure the patient noted a strange taste in his mouth The treatment was repeated on 13 November and the irrigation returned clear

On 14 November local irrigations and streptomycin were discontinued A total of 17 grams of streptomycin had been given On 25 November the leukocyte count was 7,000 with a normal differential count On 27 November the perforation of the drum was closed and the tympanic membrane moved normally On 1 December the hearing on both sides was 15/15 Roentgenograms showed slight residual clouding of the left mastoid (fig 4) The patient was discharged to full duty

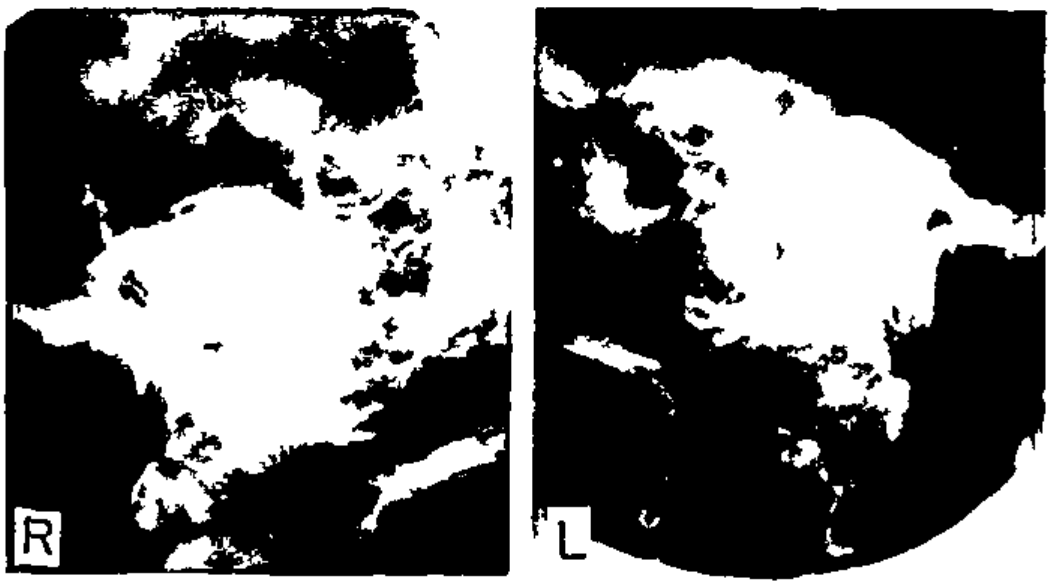


Figure 4 (2 December 1952) Aggregate right mastoid. The left mastoid shows appearance of well and only slight residual clouding (There is difference in the appearance of the other two roentgenograms but they were produced by)

Comment In this patient as in the first there was not only clinical healing but apparently complete recovery as demonstrated by the roentgenograms

DISCUSSION

We cannot hope to draw definite conclusions from the 2 cases reported here Other patients treated here gave indication of a similar response but because of their transfers follow ups were incomplete Mayer *(3)* mentioned the restitutio ad integrum in acute cases or of "increasing denseness (in chronic ones) this strong shadowing being a characteristic sign of the process of repair Bourgeois *(7)* stated that only in acute mastoiditis is

(6) Sobel E J and Boulgak N A Value of streptomycin in purulent otitis media Vestnik oto-laryngol 69 65-66 Jan 1952

(7) Bourgeois H M and Masmonteil Quelques observations de grippe (Semaine des Hopitaux de Paris 21 Jan 1929) Ann. mal de l'oreille du larynx 48 469-471 1929

clouding due to thickening of the mucous membrane " In some pa tients, edema of the mucosa causes such an increased density that the cell walls have disappeared entirely on the roentgeno grams and reappeared as soon as the edema had regressed

Moulonguet *(8)* and Lemaitre *(9)* believed that clouding is from the decreased calcium content of the bone, due to inflammatory congestion in the mucosa and that it does not necessarily imply, therefore, that the bone is involved Engström et al *(10)* stated that the inflammatory process in the mucosa causes the pH to shift toward the acid side, resulting in a reduction of the cal cium content in the air cell septums In chronic mastoiditis the formation of the osteitic changes with osseous accretions on the cell walls has been discussed by Diamant and Lilja *(4)* Mayer *(3)* Mittermaier *(11)*, and Engström et al *(10)* Cashion *(12)* stated that, both with and without sulfonamide therapy, there are varying degrees of osteitic thickening Mayer and Mittermaier be lieved that osteitic change appears only when there is complete focal destruction of bone by an infectious process and, after healing, mildly decalcified zones would be seen with their previous configuration

Diamant and Lilja believed that destruction is not necessary before this change takes place They demonstrated osteoid forma tion histologically within 1 month and new bone formation roent genologically within 3 months after the discharge from the ear began

In untreated chronic mastoiditis whatever the mechanism may be, the inflammratory process can be stopped with aatibiotics even in the most deeply situated mastoid cells and the calcium content of the walls of the air cells can be returned to norn al, as demonstrated by the roentgenogram

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(8) M lo guet A D sc n in f tnot refer *(7)*

(9) Lemaitr F Discuss on n footn t r fer ce *(7)*

(10) Engstr m A Harnb rge C A and W lin S R ntgen ray m cro pectr graphic invest gation of nflammatory dest uct n of mast id bon Br t J Radiol 22 309-324 June 1949

(11) M tt ma r R R tgenol gischer Beitrag zur Frage der E nochen eub ld ng be Mast d t s Ztschr f H ls N en-u Ohrenh 45 214 227 1939

(12) Cashi W R Symp um hang s wh ch ha lted fr m u e f sulf drug the py in x ray fi dings i mast iditis N w Yo k State J Med 45 493 Mar 1 1945

Postgraduate Courses Conducted by Army Medical Service

The Army Medical Service will conduct a series of postgraduate courses during the fiscal year 1953 1954 for qualified medical officers of the Armed Forces and other physicians The courses are Clinical Laboratory Course 15 19 March 1954 at Brooke Army Medical Center, Symposium on Pulmonary Diseases 21 25 September 1953 and Clinical Electrocardiography and Recent Advances in Cardiovascular Diseases, 9 14 November 1953 Fitzsimons Army Hospital Rehabilitation Techniques in Neuromuscular Diseases and Disabilities 5 10 April 1954 Letterman Army Hospital Forensic Pathology 2 6 November 1953 and Pathology of the Oral Regions 8 12 March 1954 Armed Forces Institute of Pathology Seminar in Urology, 7 9 September 1953 Symposium on Circulation and Homeostasis 5 9 October 1953 Symposium on Physical and Mental Health Standards 16-17 April 1954 and Recent Advances in Medicine and Surgery including Psychosomatic Aspects of Medicine and Surgery 19 30 April 1954 all at Walter Reed Army Medical Center

Physicians who are certified by a specialty board or qualified for certification chiefs or assistant chiefs of services at hospitals and officers well advanced in the study of their specialty are eligible to attend any of the courses Officers partially qualified in a specialty or with a special interest in it are eligible to attend the courses at Brooke Army Medical Center Fitzsimons Army Hospital the Armed Forces Institute of Pathology and the Symposium on Circulation and Homeostasis at Walter Reed Army Medical Center

Applications for admission to any course must be submitted at least six weeks prior to the opening date Medical officers on active duty and full time Civil Service physicians should forward their applications through military channels to the Office of the Surgeon General Department of the Army Washington 25 D C Army medical officers not on active duty should forward their applications to the Army Area Commander to whose jurisdiction they are assigned National Guard medical officers should apply under current National Guard regulations

Officers on active duty submitting requests to attend courses should give their name rank service number and medical specialty organization and station and the course they wish to attend

HEPATOLENTICULAR DEGENERATION TREATED WITH BAL

HAROLD A LADWIG *Lieutenant, MC USNR*

THE initial description of the lesions seen in hepatolenticular degeneration was made by Wilson[1] in 1912 It is a rather rare disease with an unknown etiology and a tendency for familial occurrence Hepatolenticular degeneration usually occurs in adolescence but the onset of symptoms has been reported in childhood as well as in the third and fourth decades of life The onset is usually insidious with gradual progression over a period of years, but it may be sudden with a high irregular fever, rapid emaciation, and rapid progression to a fatal termination within a few months [2] Tremor is usually the first symptom is present in every case, and is seen in the head, trunk, and extremities, increasing with movement and emotional factors, but it is also present at rest.[3] Athetoid and choreic movements may also occur There is hypertonia or rigidity of the musculature which may lead to contractures Muscle wasting is seen in some patients Deep reflexes are usually hyperactive pathologic toe signs are usually not observed There are no sensory changes Dysarthria and dysphagia of a progressive nature are noted The Kayser Fleischer ring is pathognomonic but is not always present Emotional disturbances in the form of involuntary laughing or crying may be present Psychotic states and mental deterioration are frequently present in the terminal states

PATHOLOGY

Hepatolenticular degeneration is characterized by the presence of bilateral symmetrical degeneration of the lenticular nuclei which may be seen grossly as cavitation the putamen being more severely affected than the globus pallidus Cirrhosis of the liver is associated with the lenticular degeneration The findings of liver function tests may not be abnormal

CLINICAL INVESTIGATIONS

Studies in hepatolenticular degeneration by Haurowitz and Cumings[4] revealed an increased copper content in the liver and

From the U S Naval Hospital Great Lakes Ill Lieutenant Ladwig now with Admiralty Hospital and University Hospitals Minneapolis Minn

some areas of the brain especially the basal ganglia Cumings obtained copper values varying from 39 4 to 156 5 mg per 100 grams of dried hepatic tissue in hepatolenticular degeneration as compared with the normal range of from 3 7 to 17 2 mg for this tissue The same investigator revealed that the copper content of the basal ganglia in this disease varied from 69 5 to 71 6 mg as compared with the normal values of from 6 1 to 19 mg per 100 grams The Kayser Fleischer ring seen in hepatolenticular degeneration is in part due to the deposition of copper in the cornea

Clinical investigation of copper metabolism following an injection of BAL in disseminated sclerosis and in a patient with hepatolenticular degeneration revealed an increased urinary excretion of copper in these patients as well as in normal subjects [7] The greatest urinary excretion of copper was noted in the patient with hepatolenticular degeneration Cumings[8] treated 4 patients with hepatolenticular degeneration with BAL and noted clinical improvement in 3 In the 5 patients with this disease reported by Denny Brown and Porter a marked increase in urinary excretion of copper was noted and beneficial effects were observed following treatment with BAL They estimated that the net total copper mobilized during a 3 day course of BAL was about 3 mg In the normal patient this would amount to about half the copper content of the liver in hepatolenticular degeneration it is only about 5 percent of the hepatic copper content These investigators concluded that the increased urinary excretion of copper observed even in the untreated patients with hepatolenticular degeneration probably reflects a disorder in the absorption of copper This results in an excessive amount of the metal in the serum which in turn accumulates in the tissues and overflows at a renal threshold Recently Streifler and Feldman[10] administered BAL to a patient with advanced hepatolenticular degeneration and noted striking clinical improvement This was paralleled by a diminution of the patient s electroencephalographic abnormality

BAL was introduced as an antidote to the arsenical vesicant The dithiol group of its molecule forms a relatively nontoxic compound with the arsenoxides and the nontoxic compound is rapidly excreted in the urine Observations in subsequent studies revealed that BAL also promoted excretion of other metals including copper

The following is a report on a patient with hepatolenticular degeneration treated with BAL

CASE REPORT

A 29 year old man stated that a tremor of the abdomen was first noted during a routine physical examination in 1945 He was

completely unaware of the tremor at the time He was hospital ized for about 5 weeks and a diagnosis of combat fatigue was made He considered this diagnosis unjustified and returned to his military duties until August 1949 at which time he was hospitalized because of weakness, malaise, and diarrhea During the course of his hospitalization he had a tremor of his extremities, excessive perspiration, a palpable spleen and liver, and an elevated BMR He was discharged with a diagnosis of viral hepatitis

For his increased metabolic rate he was given a trial period of treatment with thiouracil This did not alter his BMR signifi cantly From October through December he was given 0 1 gram of phenobarbital t i d and 100 mg of thiouracil daily He was again admitted to the hospital on 9 Februarv 1950 for further studies of his thyroid activity On admission a tremor of his ex tremities and splenohepatomegaly were noted His BMR was plus 29 and his total blood cholesterol was 170 mg per 100 cc The diagnosis was changed to hyperthyroidism without evidence of goiter, and the patient received 3 millicuries of radioactive iodine Following this therapy he noted essentially no improvement of his tremor His BMR was plus 8 and his blood cholesterol was 144 mg per 100 cc

In the course of the following vear the patient noted an in crease in the tremor of his extremities and subsequently was hospitalized Because of his tremor he was seen by the neuropsychiatric service Interviews revealed an obsessive compulsive personality structure and it was thought that this could be the cause of the tremor He was returned to duty where he again noted an increase in the severity of his tremor and inability to perform his duties as a typist These symptoms necessitated his admis sion to the United States Naval Hospital, Great Lakes, Ill , on 19 March 1952

On admission the patient had a marked tremor of the head, abdomen, and upper extremities with increased tonus of all ex tremities The tremor involved chiefly his right shoulder and left hand, increased on intention, disappeared almost completely when he was lying down, and was of a very coarse rhythmical nature having a rate of 3 or 4 oscillations per second Exami nation of the eyes revealed a brown Kayser Fleischer ring at the edge of both corneas This was best demonstrated with a slit lamp There was a slight bilateral exophthalmos The liver was firm, not tender to palpation, and palpable 1 fingerbreadth below the right costal margin Neurologic examination revealed a slight dysarthria The patient was unable to sustain motor trength for prolonged periods There was marked in co-ordination of the upper extremities with diminished alternating

rate more pronounced on the left The in co-ordination was due chiefly to the presence of the tremor The reflexes in the upper extremities were hyperactive and equal The abdominal reflexes were present in both upper regions they were absent in the right middle and lower abdominal areas but present on the left in these areas Cremasteric reflexes were present and equal bilaterally Reflexes in the lower extremities revealed a hyperactive knee jerk on the right Ankle reflexes were present and equal

The patient s leukocyte count was 5 000 with a normal differential count His hemoglobin was 13 5 grams and the hematocrit was 43 volumes per 100 cc His nonprotein nitrogen was 38 mg per 100 cc fasting blood glucose 80 mg per 100 cc total protein 6 86 grams per 100 cc albumin 4 12 percent and globulin 2 74 grams per 100 cc His sulfobromophthalein retention was 2 67 percent at 47 minutes and 1 67 percent at 60 minutes His serum bilirubin (Watson) at 1 minute was 0 1 mg per 100 cc total 0 51 mg per 100 cc His thymol turbidity was 3 4° units thymol flocculation 1 plus ammonium sulfate, 3 4° units zinc sulfate 8 38 units choline esterase, 0 47 units and cephalin cholesteral flocculation negative at 24 and 48 hours His alkaline phosphatase was 3 08 Bodansky units His urine coproporphyrins were 147 07 gamma per 24 hours

On 1° March a liver biopsy was obtained Microscopic examination of the tissue revealed gross alteration of the usual architecture of the liver tissue The capsule was thickened due to a fibrosis and cellular infiltration consisting of lymphocytes for the most part The parenchymal tissue consisted of roughly spherical nodules of hepatic cells which had lost most of their orient round the central vein These nodular masses were emb connective tissue which contained many small bile ducts ard ru l mphocytes and fibroblasts There were occasional polymo ucleocytes and eosinophils in these broad fibrous tissu c t The hepatic cells themselves showed marked alteration In some lobules there was marked vacuolization of cytoplasm due to an accumulation of fat other lobules were completely free of fatty change In many instances the hepatic cells contained or three nuclei The nuclei frequently were large hyperchromatic and contained a large eosinophilic vacuole Although some lobules showed marked fatty degeneration active necrosis of hepatic cells was not seen (fig 1)

In May 195 the patient was given 1 cc of a 10 percent solution of BAL intramuscularly twice a day for 5 days The dosage was then increased to 1 5 cc twice a day for 5 more days The patient stated that following the injection he felt lethargic at times and on two occasions he became quite nauseated with the medication He reported that following this therapy his sleep was no longer interrupted by tremors and that he was able to drink coffee from a cup He became more active following this course

of therapy and his physical capacities increased almost to their previous level A second course of BAL was started in August Immediately before this therapy the patient had again complained of extreme fatigue and an increase in tremor During the second course of treatment he was given 1 cc of a 10 percent solution of BAL twice a day for 3 days This was increased to 1 5 cc twice a day for 7 days He experienced neither nausea nor leth

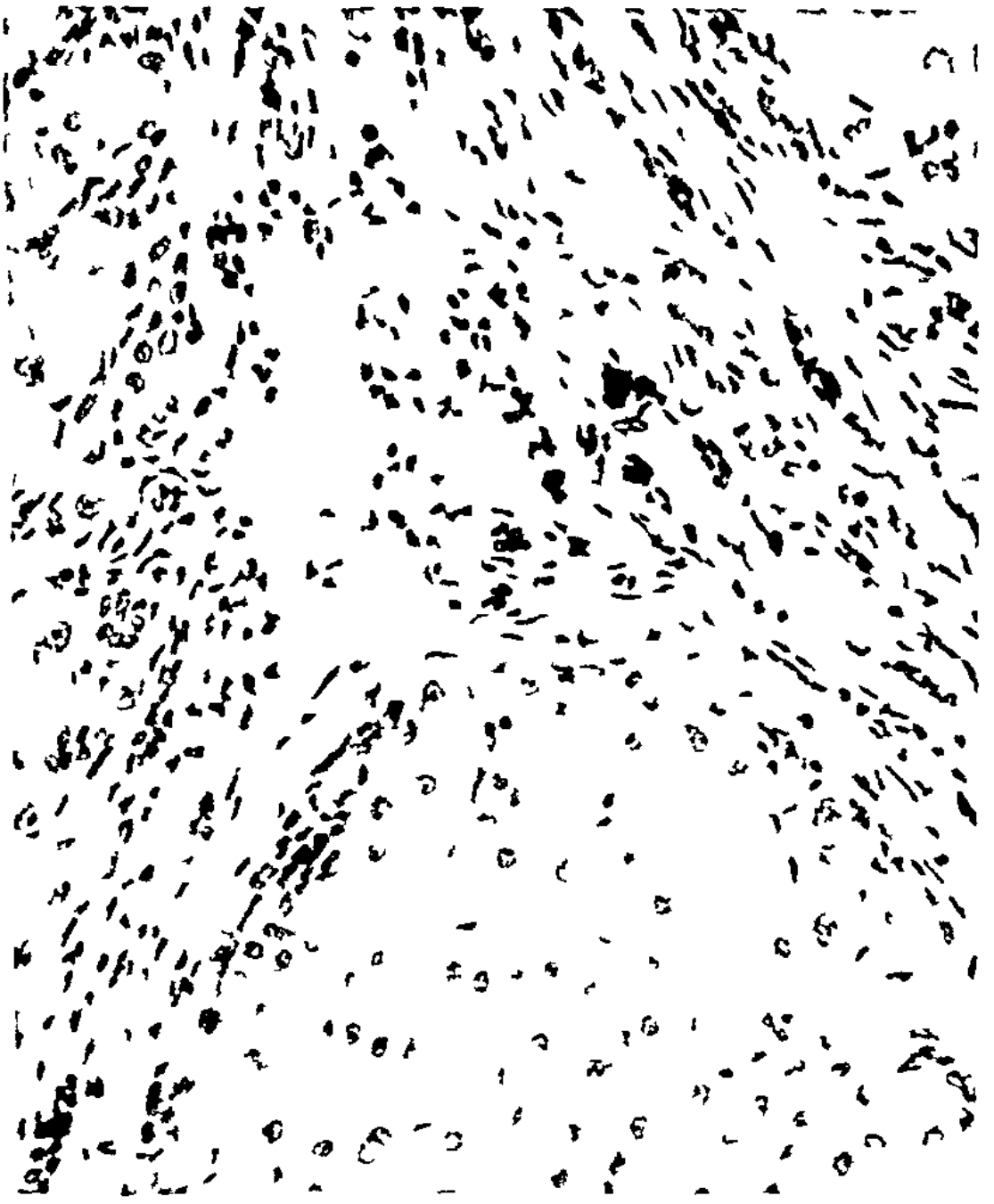


Fig e 1 Photom crograph how ng the marked vacuol zat on of the h patic cells The e cells ha e lost thei normal patte n and many co ta n multiple nucle The f brous tissue s ounding the pa enchymal cells i i fil ated with lymphocyt s and monon clea cells Small bile d ct are also een in this a ea.

urin the second course of therapy but complained of some r r s in the local area of the injection He again noted an e in his tolerance to physical exertion Objective testin l d minimal improvement of the tremor

COMMENT

∿ tru with many neurologic conditions, the exact diag ı ot made early in the course of the disease Because enco of minimal neurologic findings in the form of a p tiont was given a psychiatric diagnosis followed peutic interviews This too, is a frequent occur onic neurologic disorders which are manifested inimal objective findings Such patients may sorders disproportionate to the organic in ervous system and these tend to mask the ltıes in adequately assessing improvement objective of any form of tremor are mani cause this symptom varies so readily with

SUMMARY

ep tolenticular degeneration was treated with B \ I oted subjective improvement following this treatm nt the improvement in his tremor was minimal

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GAS SHADOWS IN ROENTGENOGRAMS OF COLON

Their Significance in Strangulated Small Bowel Obstruction

CHARLES E PARKINSON *Captain, USAFR (MC)* (1)

THE gratifying improvement in the prognosis of acute obstruction of the small bowel that has been realized in the past decade and a half has been the result of early decompression by intestinal intubation, maintenance of the electrolyte balance, proper use of antibiotics, and early operation The most important single factor is the speedy restoration of the continuity of the bowel lumen, and this generally depends upon prompt surgical intervention

The diagnosis must be of sufficient precision and decision to justify a laparotomy This decisive diagnosis of early intestinal obstruction is not always easy, for as Wangensteen (2) has so aptly stated, "The cardinal symptoms of obstruction are three, pain, vomiting, and distension * * * but these complaints are so much a part of all acute abdominal lesions that their occurrence affords no satisfactory distinguishing characters "

The clinician, faced with the recognized necessity of early and accurate diagnosis seeks all possible aid Since Case (3) first described the significance of gas shadows in detecting ileus, the "flat film" of the abdomen has earned an important place in the diagnosis of obstruction The value of roentgenographic examination in differentiating adynamic, (reflex or paralytic) ileus from mechanical ileus is well established The basic roentgenographic differentiation of these two forms of ileus rests largely upon the greater degree of distention of intestinal loops, and the absence of gas in the large bowel that is seen in mechanical ileus It is not as generally recognized that in mechanical ileus complicated by strangulation, considerable amounts of gas may persist in the large bowel, and

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(1) Formerly at Keesler Air Force Base Miss now at Leila Y Post Montgomery Hospital Battle Creek, Mich

(2) Wangensteen O H Intestinal Obstructions 2d edition Chapter 6 Thomas Publisher Springfield, Ill., 1947 p 93

(3) Case J T New aid in early recognition of post operative ileus J Michigan M Soc 19 151 Apr 1920

further that this persistent gas distal to the point of obstruction is in itself suggestive of strangulation

The case of obstruction due to enteric intussusception reported in this article was seen in July of 1952 In September of 1952 Rigler and Mellins (4) reported their study of a large number of strangulating obstructions of the small intestine and presented a synopsis of the roentgen signs suggesting this entity They pointed out that strangulated obstructions generally present one or more of these signs (1) coffee bean shaped gas shadows due to closed loops (2) pseudotumors due to fluid-filled loops (3) absence of mucosal pattern (4) fixation of distended loops, and (5) moderate amounts of gas in the colon

The clinical findings suggesting strangulation in obstruction are due to peritoneal irritation resulting from the liberation of bloody fluid from the infarcted segment of intestine In the first case report there were no clinical signs of strangulation for as Wangensteen (2) points out, An intussusception may be unattended by rebound tenderness because the infarcted intestinal segment lies within a normal enshoathing cylinder hence bloody fluid may not escape into the peritoneal cavity In this patient there was no opportunity for the highly diagnostic "coffee-bean" sign of closed loops to form It is interesting to note that persistent gas in the colon in the presence of other signs indicating small bowel obstruction, was the most significant diagnostic finding from the roentgen point of view The first interpretation of this finding as indicative of incomplete obstruction was not only erroneous but would have been extremely dangerous if it had not been re-interpreted and judged to be consistent with complete obstruction in the presence of strangulation

CASE REPORTS

Case 1 A 22 year-old woman was admitted to the hospital because of abdominal pain of approximately 8 hours duration followed by nausea. Eighteen days before she had been operated upon for suspected acute appendicitis An essentially normal appendix was found and removed Evidence of mesenteric lymphadenitis was noted and it had apparently accounted for the patient's symptoms Before closing the abdomen an uninfected Meckel's diverticulum was found and resected The surgeon recorded that after diverticulectomy the defect in the ileum was closed without impairment of the intestinal lumen Her postoperative course had been uneventful until the onset of the present illness

(4) Rigler L G and Mellins H Z Paper presented before the Forty-Third Annual Meeting of the American Roentgen Ray Society Hot Springs, Va 23 Sept 1952

The presenting symptom was pain, intermittent in character, and centered in the periumbilical area A few hours after its onset she became nauseated but did not vomit. The intensity of the pain progressed for several hours, then diminished to a constant, low grade aching pain that supplanted the colicky intermittent pain The abdomen was diffusely tender without signs of peritoneal inflammation Her temperature was 99° F At the time of physical examination, approximately 9 hours after onset of pain, the opinions of several observers varied as to the presence of peristalsis The leukocyte count was 10,800 with a mild shift of the Schilling count to the left.

A flat roentgenogram of the abdomen demonstrated a few loops of mildly distended small bowel and considerable gas in the cecum, which was interpreted as consistent with incomplete mechanical ileus Two hours later, a second roentgenogram of the abdomen (fig 1), showed some increase in small bowel distention although the cecal gas remained constant, as did the position of the distended loops This was interpreted as representing evidence of complete small bowel obstruction It was believed that the persistent cecal gas suggested bowel stasis distal to the point of obstruction, most likely due to intra abdominal inflammation or to a segment of strangulated intestine

Surgical exploration revealed an enteric (ileal) intussusception at the point of the previous diverticulectomy The intussusceptum was devitalized and a resection of about 16 cm of ileum was performed with end to-end anastomosis The patient recovered without complications and her subsequent course has been uneventful

Case 2 A 19 year-old woman was admitted to the hospital with a history of previous "ovarian surgery" and a present illness clinically typical of acute small bowel obstruction of 10 hours' duration The roentgenogram (fig 2) is of interest because, in addition to considerable large bowel gas, there is a typical "coffee bean" shaped gas shadow At operation she was found to have strangulated obstruction due to adhesions, and a gangrenous intestinal segment requiring resection and anastomosis

Case 3 A 30-year-old woman was admitted to the hospital because of severe left lower quadrant pain of 6 hours duration Her past history included an appendectomy and partial left oophorectomy for "cysts" 6 years prior to this admission

She had experienced nausea, but no vomiting The pain was described as sudden in onset, persistent and steady, with

Fig 1 C l ga badou ar pr ent with the d of l l d bad w a d

2 l l b l l l // e-be ga bad tion (l l l pil) Fig e 2 \ l

intermittent exacerbations of intensity Her abdomen was diffusely tender and rebound pain was present. Her menstrual periods had been regular and her next period was impending Shortly after admission vaginal bleeding was noted for the first time Pelvic examination revealed exquisite tenderness and a mass in the left adnexal area about the size of a lemon



Figure 3 This roentgenogram shows gas in the colon and a fluid filled loop and evidence of free fluid in the pelvis

A catheterized urine specimen was negative The leukocyte count was 14,500 and the red blood cell count was 3 5 million

A roentgenogram of the abdomen (fig 3) revealed a C shaped loop of dilated small bowel, a fluid filled loop and free fluid in the pelvis, and considerable gas in the colon (She had not been given an enema) The preoperative clinical diagnoses were (1) ruptured ectopic pregnancy and (2) twisted ovarian cyst. At operation a strangulated loop of ileum was found caught

between adhesive bands This segment returned to its normal physiologic state upon release of the adhesive bands and the application of warm saline packs Resection was not necessary

SUMMARY

Roentgen evidence of considerable gas in the colon may exist in the presence of small bowel obstruction In some instances this finding not only fails to rule out mechanical ileus but may be highly suggestive of strangulating obstruction A patient is presented in whom an infarcted ileal intussusceptum was ensheathed by uninfarcted ileal intussuscipiens and therefore failed to present the clinical signs of strangulated obstruction, (peritoneal irritation) The roentgen study suggested the infarction which was proved at operation Two other case reports in which considerable large bowel gas was noted in the presence of mechanical small bowel obstruction are summarized.

DEXTRAN IN LIEU OF PLASMA

Army SGO Circular Letter No 89 announces that 6 percent dextran in saline solution is now available as a substitute for plasma for clinical use in restoration and maintenance of blood volume Because of its comparative higher cost the known relationship between homologous serum hepatitis and plasma infusion and the current need of plasma for the production of specific globulins plasma should be used to support blood volume only when dextran is unavailable

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The l ti n hip of chronologic age and types of motivation leading to n ffecti e flyi g performance seems definite and substantial But the s me cannot be said for the psychologic area of fear of flying It i i cle r from this study (aging in Air Force pilots) what variable or v ble other than chronologic age build up fear behaviors in air cte m

WALTER R MILES a d BEATRICE M SHRIVER
1 Jour l of G t l gy

BOMBARDIER'S PALSY

Report of a Case

PAUL E WRIGHT *Lieutenant Colonel* USAF (MC)

JAMES H BRAATZ *Second Lieutenant* USAF (MSC)

BOMBARDIER S palsy is a term applied to an occupational illness characterized by paralysis of the muscles supplied by the deep peroneal nerve and resulting in foot drop. This condition occurs as a result of kneeling over an aircraft bombsight for variable periods. The only aircraft in which the bombardier is required to perform his duties in the kneeling position is the B 26 (light bomber) In other types of aircraft he assumes the sitting position.

The direct cause of this paralysis was believed to be due to pressure or tension on the peroneal nerve in the vicinity of the knee [1]

CASE REPORT

A B 26 bombardier reported to the flight surgeon's office on 10 December 1952 because of weakness in the right leg and difficulty in walking, which had become more disabling after each practice bombing mission. He was hospitalized and given vitamin B complex and physical therapy exercises for the dorsiflexor muscles of the right ankle, stretching of the gastrocnemius and soleus muscles, and the Kabat-Kaiser mass movement and knee-ankle exercise to the point of fatigue. Improvement was fairly rapid (table 1) and the patient returned to flying duty on 29 December 1952

On 14 January 1953 the patient returned with his original complaint following his first flight as bombardier The mission was of 3½ hours duration and he had been in a kneeling position 5 minutes out of each 12. He was grounded for 60 days to allow complete healing of the injured nerve and the same treatment was resumed Examination at this time revealed partial right foot drop, with moderate loss of power in the anterior tibial muscles He walked quite well on the balls of his feet but had difficulty with the right foot when he attempted to walk on his heels There were no muscle atrophy or masses along the course of the peroneal nerve The dorsalis pedis pulses were normal and

From U S Air Force Hospital Langley Air Force Base Va Read at a meeting of the Section on Aviation Medicine and published in the Journal of the American Medical Association May 16

equal bilaterally Sensory findings and tendon reflexes were normal No pathologic reflexes were elicited

TABLE 1 *Muscle paralysis*

Muscle	11 December 52	18 December 52	31 December 52
	Degree of function		
Tibialis anterior	Trace	Good	Good
Extensor hallucis longus	Trace	Fair	Good
Extensor digitorum longus	Poor	Good	Normal
Extensor digitorum brevis	Trace	Good	Good+
Peroneus	Normal	Normal	Normal

He again improved rapidly and by 26 January 1953 all physical findings were normal When he was observed in the kneeling position in the aircraft, the flight surgeon concluded that the nerve injury resulted from pressure or tension on the peroneal nerve A modified basketball kneepad (fig 1) was applied to the right knee to reduce the possibility of direct pressure on

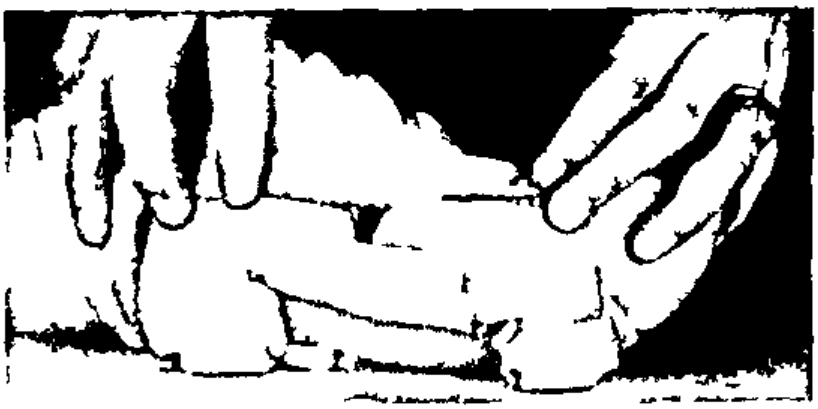


Figure 1 Improvised basketball knee pad and protective padding of right knee

the nerve This pad was tested in the aircraft by gradually increasing the time spent in the kneeling position required in bombing missions until symptoms recurred or he was able to finish the required period without symptoms He began his simulated duty position by alternating 5 minutes of kneeling with 5 minutes of rest and increased the number of kneeling and resting periods His symptoms recurred after a total of 30 minutes kneeling The former treatment was resumed until all symptoms subsided and the patient was transferred to another type of aircraft which required no kneeling

SUMMARY

There is evidence that the paralysis of bombardier's palsy is not due to direct pressure of the knee on a solid object, but to a stretching or tension of the nerve This condition will not be a serious problem in the future because the B 26 is the only Air Force aircraft in which the bombardier kneels to perform his duties

REFERENCE

1 Laird, G J nd Muell r M. J Bombardi r s palsy *The Air Surgeon s Bull.* (No 9) 1 19 S pt 1944

The question of frequency of health examinations often comes up The answer lies in the average age of the executives If over 40 examinations certainly should be done annually It must be stressed above all that regular calendar examinations must be supplemented by an understanding by the examinee that occurrence of symptoms of any kind deserves immediate investigation It is natural that he should report to the physician who has last done a periodic health examination, and who has stressed to him that the periodic examination program detects long run health trends rather than acute emergencies which are heralded by the appearance of new and unusual clinical symptoms Finally it must be stressed that the success of the program depends largely upon the thought, consideration and effort expended by the physician himself This important factor must never be minimized in any program of periodic health examinations

—FREDERICK H SHILLITO M D
in *Annals of Internal Medicine*

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equal bilaterally Sensory findings and tendon reflexes were normal No pathologic reflexes were elicited.

TABLE 1 *Mus l p t phys c l th apy*

Mus l	11 De mbe 52	18 De mber 52	31 D c mbe 52
	D gr f fu tion		
T b li te or	T c	G od	G od
Ext or hall l gus	Trac	F +	Good
Ext or d g tor m long	Poor	G od	Normal
E t or d g torum b	T	C od	Good
P on gr up	Normal	Norm l	Normal

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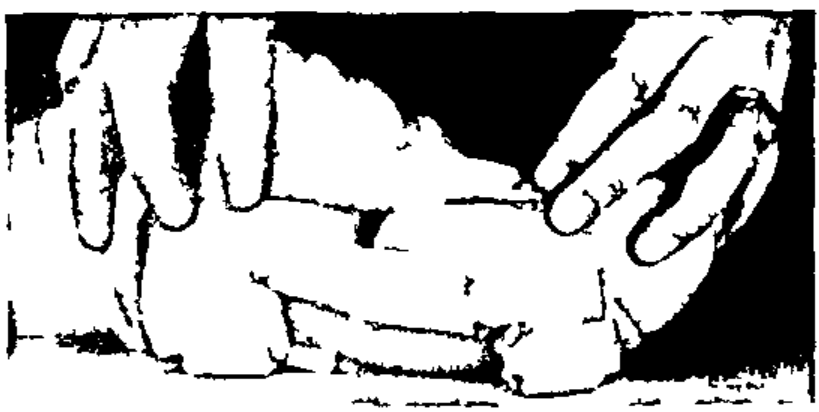


Figure 1 Improvis d ba ketball kne pad d to pr tect / / cted knee

the nerve This pad was tested in the aircraft by gradually increasing the time spent in the kneeling position required in bombing missions until symptoms recurred or he was able to finish the required period without symptoms He began his simulated duty position by alternating 5 minutes of kneeling with 5 minutes of rest and increased the number of kneeling and resting periods His symptoms recurred after a total of 30 minutes kneeling The former treatment was resumed until all symptoms subsided and the patient was transferred to another type of aircraft which required no kneeling

ALLERGIC ECZEMATOUS CONTACT-TYPE DERMATITIS DUE TO "PRO-KIT" CONTENTS

MORTON P LAZAR *Capta n, MC USA (1)*

DURING the 12 month period ending December 1952, 9 patients with an allergic eczematous contact dermatitis due to the Individual Chemical Prophylactic Packet (pro-kit) contents used by members of the Armed Forces were admitted to this hospital The following is a representative case

CASE PEPOPT

A 23 year old man was admitted with a transfer diagnosis of dermatophytosis of the genitocrural area About 24 hours after using a pro-kit, he first noticed redness in the areas where its contents had been applied His erythema progressed to an acute, oozing eczematous dermatitis and he became so uncomfortable he was unable to walk or sleep No treatment had been given before admission which was 60 hours after using the pro-kit Any movement of the lower extremities caused great pain and discomfort so that the patient remained fairly rigid The only positive finding was an acute oozing eczematous dermatitis of his penis, scrotum, the upper and medial aspects of his thighs, and the pubic region (fig 1) With the aid of Burow s solution, sitz baths, bed rest, and finally some lubricating medications, the eruption cleared and only hyperpigmentation remained After 15 days hospitalization he was discharged

DISCUSSION

Conventional closed patch testing *(2 3)* was done on the patient reported and on 8 other patients seen in this hospital Positive patch test response was observed in each patient following contact with calomel and ammoniated mercury which, in addition to the histories and physical findings, established the diagnosis

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(1) Formerly O k Army Hospital J pa ow 594 M lody La H ghland P rk Ill
(2) S lzberg M B d W F C ta pat h t t n d rmat l gy t es dv tag d l m ta ns Arch D mat & Syph 23 519-531 Ma 1931
(3) S hw rtz L T l pa L d P k S M. Occ pat nal D s as f the Sk 2d ed t L a F b g Pl lad lphia P 1947

Allergic eczematous contact dermatitis due to various types of mercurials is well known The condition of pro-kit dermatitis is so characteristic in its morphology and topographic features that the diagnosis can often be made solely on inspection with minimal difficulty The basic type of eruption is that of an eczematous type of dermatitis involving all the areas to which the pro-kit contents are applied In addition to the basic ef



Figure 1 Pro-kit dermatitis (back excepted) Subcutaneous injection Photographed 72 hours after patient was admitted to the hospital

florescence there was involvement of the neck axillas anticubital space wrist popliteal space and abdominal folds The eruption in these areas consisted of small erythematous macules papules and eczematous lesions In the more allergic patients the eczematous lesions became confluent but still were confined to the flexural areas The mildest type of eruption was a simple but persistent erythema One of the patients presented a more widespread eruption characterized by an almost universal dermatitis in conjunction with the basic eruption In each instance the basic eruption invariably was the most severe component of the efflorescence Any of the ingredients of the kit particularly sulfathiazole could be an allergen but this drug was not implicated in any of the cases reported

This entity has been recognized by many physicians but no reference to this condition could be found in the literature

Patients with pro-kit dermatitis may have been misdiagnosed in the past The referring diagnoses in the 9 patients seen in this hospital were dermatophytosis (2), heat rash (3), moniliasis (2), and dermatitis of unknown cause (2) The failure to recognize dermatitis due to pro-kit material may have been due to a low index of suspicion Most physicians questioned knew little about the kits or their contents or instructions

The widespread aspect of this dermatosis is believed to be due to absorption either from the local eruption or from the material instilled into the urethra, or both Absorption and dissemination of the allergen via the circulatory system to distant areas of the shock organ (the skin) results in the generalized aspect of the condition This tends to support the views that a reaction in previously sensitized skin may be elicited by the allergen applied externally or brought to the site via the blood stream

Certain skin areas, because of anatomic and physiologic peculiarities, were more susceptible to the eruption as shown by the predilection of the dermatitis for the flexural areas and the lack of involvement of the hands which were exposed in all patients Perhaps the hands were not involved because of the thickened keratin or excessive sweating, or because the allergen was removed by washing before it could cause difficulty Trauma from the use of the wet soap impregnated cloth and additional trauma theoretically may increase the number of acquired allergic hypersensitivities The physiologic and traumatic changes associated with coitus may add to these sensitivities Well performed studies in the field of contact allergy have shown that trauma tends to increase the number of acquired allergic hypersensitivities

SUMMARY

An allergic, eczematous, contact-type dermatitis heretofore unreported, was traced in 9 patients to chemicals contained in the standard venereal prophylactic kit

"The Art of Medicine"

The physician who is guided by the aphorism Why speak if you can keep silent? knows a great deal about the true art of medicine The seasoned doctor knows not only what to say to his patients but also what to leave unsaid

It has been pointed out that experience is of no ethical value it is the name that men give to their mistakes Experienced physicians are usually content to say very little to their patients other than giving general reassurance and simple immediate instructions They have learned the best way to avoid raising doubts and fears

This is a difficult lesson for the young physician to learn The value of silence is not immediately apparent in fact it is often foreign to him As a student and house officer he is taught to display his knowledge Unfortunately he is asked at times in the presence of the patient to mention differential diagnosis or suggest possible diagnostic procedures His instructors are careless about what they say in front of patients—in other words of how they practice the art of medicine

Besides the fact that keeping silent is new it is also difficult because of the temptation every young doctor has to prove himself by displaying his knowledge to his new patients He sometimes forgets that trusting patients credit the physician with cognizance of all possibilities and that the patient is not the professor demanding a complete list of facts He must remind himself that the patient is like a child asking for a simple answer or sometimes only a reassuring look or touch Like the child he is confused and bewildered when more is offered

The art of medicine is difficult to define and consequently difficult to teach Yet it must not be neglected for it is more important than the ability to make the most accurate diagnosis or prescribe the most effective antibiotic The expensively educated young physician though he may have academic qualifications beyond question is indeed a poor physician until he has discovered the priceless gold of silence

—FRANK A HOTARD Lt Col (ir) MC USAR
Northern Illinois Medical Journal

Association of Military Surgeons Meeting, 9 - 11 November 1953

The 60th annual meeting of the Association of Military Surgeons of the United States will be held at the Statler Hotel, Washington, D C , 9 11 November 1953 under the presidency of Rear Admiral Winchell Mch Craig, MC, USNR, of Rochester, Minn Officers of the Army, Navy, and Air Force and prominent members who will participate in the program, and the subjects of their pres entations, include

9 November

Recent Advances in Military Medicine—Maj Gen Geo ge E Armstrong MC USA Surgeon General Department of the Army

M litary Med cine of th Future—Rear Adm Lamont Pugh MC USN Surgeon General Department of the Navy

Military Medicine and the Air Force—Maj Gen Harry G Armstrong USAF (MC) Surgeon General Department of the A r Force

Military Medicine and the U S Public Health Service—Surg Gen L. A Scheele U S Publ c Health Service Department of Health Education and Welfare

Current Medical and Hospital Program of the Veterans Administration—Vice Adm Joel T Boone MC USN (Ret) Medical Director Veterans Administra tion

Recent Advances in Military Dentistry—Rear Adm Ralph Malone DC USN Inspector General Dental Bureau of Medicine and Surgery Department of the Navy

Recent Advances in Military Nursing—Col Verena M Zeller USAF (AFNC) Chief Air Force Nurse Corps

Recent Advances in Military Veterinary Medicine—Brig Gen J L Hartman VC USA Chief Veterinary Corps Department of the Army

Recent Contributions of Women Medical Specialists to Military Medicine—Col Nell Wickliffe WMSC USA Chief Women s Medical Specialists Corps Department of the Army

Recent Contributions of Medical Service Corps to Military Medicine—Col Jack Buell USAF (MSC) Office of the Surgeon General Department of the Air Force

The Reserve Force Policy Board and Its Relation to the Medical Service Reserve Programs—Maj Gen Hugh Milton II USA Executive for Reserve and ROTC Affairs Office of the Chief of Staff Department of the Army

Training in M litary Medicine for Reservists—Col William S Stone MC USA Commandant Army Med cal Servi e Graduate School Washington D C

The Symposia at Armed Forces Med cal Installations—Capt. M H Porterfi ld MC USNR Bureau of Medicine and Surgery Department of the Navy

"The Art of Medicine"

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—FRANK A HOWARD Lt Comdr (lg) MC USNR
New England Journal of Med

Morris Human Anatomy A Complete Systematic Treatise edited by *J Parsons Schaeffe* A M M D Ph D Sc D D Litt Professor of Anatomy and Director of The Daniel Baugh Institute of Anatomy Emeritus Jefferson Medical College The Contributors *Leslie B Arey* North western University *Raymond F Blount* University of Texas *Eliot R Clark*, University of Pennsylvania *Harold Cummins* Tulane Uni versity *J C B. Grant* University of Toronto *Fredrick Gudernatsch* Formerly Cornell University Medical College *Ernest Lachman* Uni versity of Oklahoma *Olof Larsell* University of Minnesota *J E Markee* Duke University *Bradley M. Patten*, University of Michigan *Richa d E Scammon* University of Minnesota, *J Parsons Schaeffer* Jefferson Medical College *C G Smith* University of Toronto *Robe t J Terry* Washington University and *Mildred Trotter* Washington University 11th edition 1 718 pages illustrated The Blakiston Co New York N Y , publishers 1953 Price $16

Although this book could be used as a text, it is primarily for eference Some changes in spelling and nomenclature, which ire readily understood and create no difficulty, have been made ind, with few exceptions, the BNA terminology is used through out Reference is made in the preface to the use of smaller type ind to the presentation of certain material in double columns is being helpful to the reader, but I did not find it so A short istorical sketch of the text and accomplishments of the original uthor is included

The illustrations, diagrams, and roentgenograms are excellent, presenting in minute detail the sections they depict The book consists of 12 sections, and the titles of the sections and grouping of descriptions are a departure from that usually en countered in texts on anatomy For example, instead of a section on syndesmology, it is called "The Articulations," because it excludes those ligaments which are not concerned with an artic ulation The first section on developmental anatomy is outstand ing A discussion of the embryology and a bibliography of the subject matter are included in each division of the text An inter esting feature is the numerous paragraphs on the clinical aspects of anatomic relationships scattered throughout the text In the section on musculature the muscles are considered on a regional basis, but at the end of the section they are classified according to function This is a valuable reference because the muscles involved in any movement of the body can be readily determined The presentation on the embryology of the heart and vascular system is thorough and fairly complete, and adds to the under standing of developmental anomalies and variations The illus trations in the section of "The Nervous System" are especially good and readily understood The section on "The Respiratory System" included much material of recent discovery and the illustration of bronchioles and subdivisions of the lung present ready reference material

There is a good index with cross indexing which makes it easier to find the subject desired I strongly recommend this book to those interested in the relation of basic anatomy to clinical medicine —*Comdr E P McLarney MC USN*

St s d D by *Har ld G B III* M D Pr f or f M d ine (N l gy) C ll U ty M d c l C ll g Att nd g Phy cia N w Y k H p t l N w Y k N Y Am r L tur S r s Pub- f t N mbe *166* A M og ph n th B er tone D f Amer n L tu t Phy l gy d t d by *R b t F P tt* M D Ph D P f r f Phys l gy d B phy c C ll U ty M d l C ll g N w Y k N Y 199 page ll t ted Ch l C Th mas P bl h Spr gf ld Ill 1953

In this book the author delineates the background of his thesis that inappropriate responses to threat especially those involving values and goals can damage or destroy man He considers Calude Bernard s concept of homeostasis only a partial answer to the problem In an emergency situation homeostasis has potential value, but damage and perhaps destruction of the organism may result when the homeostasis mechanism is inappropriately elicited by symbols and is long sustained Stress is defined as the interaction between external environment and organism with the past experiences of the organism as a major factor This monograph is written with three major divisions and an epitome the majority of the text being allotted to the experimentally observed effects of stress in man The author draws upon material (much of it previously published in separate papers) that was obtained at the New York Hospital and coordinates his experimental results to support the major thesis

h volume is significant for two reasons the emphasis given l factors in the cause and exacerbation of disease proces the dramatic demonstrations of the effects of emotional v u e upon bodily processes Whether or not other clinics c rt to substantiate Wolff s thesis the general practitioner well as the specialist will do well to heed the l olisti co ept of disease as presented by Wolff and look again at t e patie rather than the illness each is *attempting to treat*

The uth r closes with the following thought Whether appropriately or inappropriately used, adequate and protective patterns operate only in relation to the present in a manner determined b the p st and often with dangerous consequences for the future In all events there is l elp in our knowledge since we now beg to know what price we pay for a way of life There are many thing more important than comfort and a few even more important ar health But a man should appreciate what his actions ar l are costing him Then if he chooses he may pay for in pain and disease Often he will decide that his values poor that he has been confused and thence change his direc n and pace "

The volume is short and readable It deserves a thoughtful hour or two from every practitioner who occasionally inquires about the art of medicine —*Comdr R G Berry MC, USN*

Surgical Forum Proceedings of the Forum Sessions Thirty-Eighth Clinical Congress of the American College of Surgeons New York N Y September 1952 *Surgical Forum Committee Owen H Wangensteen* M D F A C S Minneapolis Minn Chairman 716 pages illustrated W B Saunders Co Philadelphia Pa publishers 1953

This volume of 129 articles represents the current results of the interests of young men in the basic medical sciences as related to surgery " It is divided into 11 sections which include stomach, heart and great vessels heart and blood circulation, gynecology, obstetrics, and anesthesia, lungs and liver, shock, portal hypertension, liver, pancreas, and blood coagulation, water balance and electrolytes, plastic surgery, and thermal injuries and cancer

All the material is on research The volume is of main interest to general and thoracic surgeons, gynecologists, obstetricians, and anesthesiologists One cannot help but believe that much of the material contained in the text will be put into use in clinical surgery in the very near future Of particular interest along this line is the material presented on artificial pumps to bypass one or both sides of the heart This book is highly recommended for physicians and residents in these specialties

—*Col S W French, III, MC, USA*

Modern Concepts of Communicable Disease by *Morris Greenberg* M D M S P H Director Bureau of Preventable Diseases New York City Department of Health Assistant Professor of Epidemiology Columbia University Attending Pediatrician Beth David Hospital New York N Y and *Anna V Mat-* R N M A Public Health Nursing Consultant in Communicable Diseases New York City Department of Health Lecturer in Communicable Diseases Willard Parker Hospital New York City Department of Hospitals Foreword by *Harry S Mustard* M D LL D 553 pages illustrated G P Putnam s Sons New York N Y publishers 1953 Price $6 20

This book is an up to date presentation of communicable disease for the nursing profession The first 135 pages are devoted to a summary of modern philosophy with respect to communicable disease aseptic technics, and nursing care in the hospital and home The remainder of the book deals with specific diseases and outlines the clinical features, treatment nursing care and prevention of each

It is an accomplishment to crowd all this information into 535 pages and, in so doing the authors have had to omit much detail Nurses will find that the book is a concise presentation and a fair statement of present day thinking and practice There are many excellent features and the defects are those inherent in condensation —*R L Gould M D*

Th Conc pt on of D se It H tory It V on nd It N ture by W *lth R s* M D 120 page Ph l oph c l L brary N w York N Y p bl her 1953 P $3 75

This little book deals with man s ideas of disease which range from the invasion of spirits and demons as a cause of pathologic conditions to bacteria and the subconscious mind The author points out the importance of the hippocratic approach as a turning point in human thought For the first time the physician abandoned gods and demons and looked to the patient as the center of diagnostic prognostic and therapeutic interest and effort. One of the most absurd theories of disease was that of Rosseau whose thesis was that primitive man enjoyed perfect health and that disease was a product of civilization Two or three chapters are devoted to the relation of disease to art. The book is recommended to the intelligent general reader and to the physician as giving a broad and philosophical view of disease and medical practice

—*Capt L H Roddis MC USN (Ret)*

The D bet N uropath by *J ph I Goodma* M D *S gf l d B moel* M D *Leona d F k l* M D *Lo J Marc* M D nd *S gmund W erm nn* M D. Am Lectur S e P bl t o N mbe 151 A Mo og ph th B an tst D tion f Ame L tur in End nol gy d t d by *Willa d O Th mpson* M D Cl l Pro- f f M di U ty f Ill Colleg f M d c Man- g g Ed t J urnal f Cl l End ol gy d M tabol m Ed or Jour l f th Am ic G t c So ty Ch cago Ill 138 pag ill ra d Ch l C Th mas P bl her Sp gf ld Ill 1953 P $4 75

To the clinician the neurologic complaints of the patient with diabetes constitute not only a therapeutic problem but al o a pathologic and etiologic enigma The standard textbooks on diabetes are specific enough in most instances but the clinician may often become confused by conflicting opinions among various authors This small monograph on the subject will prove helpful in the understanding of the physiologic path ologic nd anatomic problems involved It is a straightforward discus ion of personal and recorded clinical observations and the theori which have been derived therefrom The work of five author has been integrated to cover the different aspects of diabetes neuropathies Controversial subjects receive frank coverage The difficulties in evaluating treatment are empha sized ar arious hiatuses in our knowledge of certain path ologic as are offered as particularly important for future investigati

This wil a useful book for the clinician It makes excel lent readir for the investigator who would like to have the problem lai ankly before him

—*Lt Col E D Palmer MC USA*

Surgery of the Pancreas by *Richard B Cattell* M D Surgeon The Lahey Clinic New England Baptist Hospital and New England Deaconess Hospital and *Kenneth W Warren* M D Surgeon The Lahey Clinic New England Baptist Hospital and New England Deaconess Hospital 374 pages illustrated W B Saunders Co Philadelphia Pa publishers 1953

The stated purpose of the authors is to discuss pancreatic disease with particular emphasis on diagnosis, surgical treatment, and the results of such treatment This has been accomplished clearly and concisely, and all important aspects of pancreatic disease except diabetes mellitus are covered

The text is divided into nine separate headings including anatomy and physiology of the pancreas, congenital malformations acute pancreatitis, chronic relapsing pancreatitis, pancreatic cysts, pancreatic injuries, islet cell adenomas and hyperinsulinism, carcinoma of the pancreas and periampullary area, and total pancreatectomy The experiences of the Lahey Clinic with patients suffering from the various types of pancreatic disease are summarized and the conclusions regarding treatment are presented Representative case histories and statistical charts are included to support the authors' conclusions Reproductions of roentgenographic films and anatomical sketches are used to clarify diagnosis, operative findings, and surgical technics The studies and conclusions of other eminent surgeons in this field are summarized and an extensive bibliography is included

This book will not be appreciated by a medical student but is highly recommended to any surgeon interested in abdominal surgery and the internist concerned with gastrointestinal disorders This is the most complete, concise, and readable publication on this subject in current medical literature

—*Lt Col P V Kiehl MC USA*

Clinical Cardiology edited by *Franklin C Massey* A B M D Assistant Professor of Medicine Hahnemann Medical College Philadelphia Pa 1 100 pages illustrated The Williams & Wilkins Co Baltimore Md 1953 Price $13 50

This comprehensive book covers the clinical aspects of heart disease There are chapters on anatomy, physiology, roentgenology, electrocardiography and the usual clinical varieties of heart disease including neurocirculatory asthenia and other psychiatric aspects of cardiology The book is intended primarily for internes residents, and general practitioners

The chapter on electrocardiography is excellent but brief, and those on hypertension, disturbances in coronary circulation, and anesthesia and surgery in the cardiac patient, are among the best The discussion of surgery of congenital and acquired

lesions of the heart is good but would be more valuable if more emphasis had been given to the clinical features and less to surgical technics One chapter entitled mechanisms and clinical features of congestive failure contains an adequate discussion of the mechanisms but scarcely mentions the clinical features

The greatest weakness of the book is that of repetition which is inherent in works which have a large number of contributors The various authors do not always agree which will be confusing to the student The printing is excellent but the paper is heavy making the book rather ponderous There is an excellent index

—Col E M Goyette MC USA

R h h I t pr t t Ad e d T h q by L *I Ph ll p* Ph D D ctor f P y h l g c l R h W e t St t H p t l A oc t P f or of P y h l gy Cl k U ty Wotc t r d *J ph G Sm th* Ph D R e h A t C mm on on H m n R ource nd Ad a d T g W h gton D C 385 p g ll t t d G un & Stratt I New York N Y p bl h rs 1953

This book may be expected to take its place alongside the text by Klopfer and Kelley and with Beck s three volumes It is very comprehensive in its scope although insufficient attention is given to the recent critical literature A considerable portion of the presentation is based primarily upon the authors clinical and personal research experience

Separate chapters are devoted to the scoring interpretation and rationale of the various formal aspects of the Rorschach location form color movement shading and achromatic color The authors are sufficiently courageous to offer two detailed chapters on content and sequence analyses—approaches which seem to play a prominent but heretofore implicit role in most contemporary Rorschach interpretations A final chapter presents an elaborate step by step analysis of a patient s protocol

As a teaching manual for advanced graduate students the book has many points in its favor because it is abundant with hypotheses eagerly awaiting verification or refutation It was not meant for the hands of a naive psychometrician particularly because there is no mention of the possible limitations of the instrument

The author s statement in the foreword should not be glossed over too lightly This book is intended primarily as a practical reference It is composed largely of statements about relationships between Rorschach performance and other behavior Unfortunately few of the relationships which are asserted have been corroborated most represent guessed at laws They are perhaps best employed with equal parts of faith and skepticism

—S Fisher Ph D

Modern Concepts of Leprosy by *Harry L. Arnold Jr* M D F A C P Department of Dermatology Straub Clinic Honolulu Hawaii Contributing Editor International Journal of Leprosy American Lecture Series Publication Number 145 A Monograph in American Lectures in Dermatology edited by *A thur C Curtis* M D Chairman Department of Dermatology and Syphilology University of Michigan Ann Arbor Mich 105 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $3 75

The author states in the preface that "it is hoped that dermatologists and others may find this monograph a happy medium between the brief chapters on leprosy to be found in most general textbooks and (for them) the unnecessarily detailed accounts found in books devoted exclusively to leprosy It is written for them and for students in their field, and not for leprologists" He has more than accomplished his objective by producing a readable, illustrated monograph which effectively combines the old and modern diagnostic and therapeutic concepts of this ancient disease He has successfully avoided the usual confusion associated with texts pertaining to leprosy, by discussing briefly and concisely the etiology, epidemiology, classification and nomenclature, and diagnosis of leprosy and both preventive and active tuberculoid leprosy and treatment The various diagnostic procedures are described in detail The reader may proceed into the more detailed aspects of leprosy through the use of the excellent bibliography of 105 references This monograph is essential to the library of every dermatologist and others who may be confronted with the necessity of diagnosing and treating the disease —*Lt Col H N Piper MC, USA*

Shame and Guilt A Psychoanalytic and a Cultural Study by *Gerha t Pie s* M D Staff Member The Institute for Psychoanalysis Chicago Ill and *Milton B. S nger* Ph D Prof ssor of the Social Sciences College of the University of Chicago Chicago Ill Foreword by *Roy R G inke* M D 86 pages Charles C Thomas Publisher Springfield Ill 1953 Price $3 5

This is a short, well written monograph of the differentiation between shame and guilt genetically, phenomenologically, and dynamically By a simple straightforward presentation the authors have avoided the semantic maze that clouds so much of psychiatric literature The book is divided into two parts for the psychoanalytic and cultural presentation In the cultural section the author develops a good reason for doubting the validity of the present divisions of guilt and shame cultures A more constructive and fruitful approach to the problem of characterizing and comparing cultures is presented The book can be highly recommended to anyone interested in understanding and helping to modify human behavior —*Capt W E Roudebush MC USA*

B l g cal H zards of Atom c En rgy B g th paper r d t th Coo f c ned by the I t t of B l gy nd th At m Sc t t A oc t on Oct ber 1950 d ted by *A Haddow* 235 pages Il t d Oxford U ty P e N w York N Y p bl he 1952 P $8

This volume comprises 24 papers on such varied subjects as *radiation damage genetic effects protective measures* clinical use of radioisotopes and therapy in radiation damage The authors with the exception of those from the United States and Sweden are all from the United Kingdom and are engaged in biologic research in the atomic energy programs of their respective areas Although the book is a report which probably will not be widely read because of the nature of the subject matter it gives modern views on the subject of biologic effects of ionizing radiation in a clear concise manner

—Col R D Maxwell MSC USA

Th R ddl of Ca c by *Cha l Ob l g* M D tr l t d by *W ll m H* B *gl m* M D R d ed t on 238 pag Y l Un y P N w H Con publ he 1952 P $5

In the author's preface to the first edition of this book he stated that it is addressed particularly to medical students and to those physicians desirous of some acquaintance with the trend of cancer research today This was a beautifully and thoughtfully written book which fulfilled the author's purpose in an admirable manner The revised edition containing over 30 percent new material is even more interesting and instructive The chapter on heredity surveys and particularly in the discussion of the chemical carcinogens has been brought up to date The role of the viruses in the etiology of cancer is thoroughly considered Data has been accumulated suggesting that the importance of those agents in the causation of malignant disease cannot be easily minimized

This book is divided into five main parts the introductory chapter considers the question of why cancer should interest us the second outlines the development of knowledge on the *nature of cancer and the third is concerned with a discussion* of three hypotheses of cancer etiology (irritation embryonal and microbic or parasitic) The important fourth chapter surveys the subject of experimental cancer The author discusses transplantable tumors and then considers the induced tumors including those associated *with carcinogenic rays* parasites hereditary factors tar or carcinogenic hydrocarbons and steroid hormones

Evidence [illegible] ting to a virus as a cause of cancer is presented and this hypothesis is staunchly defended

In the concluding chapter the facts in favor of a virus are summarized but some objections to the theory are pointed out. This book is a clear and concise review of fundamental cancer research which is readily understood by a novice in the field To the knowledge of this reviewer, there is no book in English that covers this fascinating subject in a more interesting or instructive manner It should command a wide-reading audience, not necessarily one limited to the medical profession, and is recommended without hesitation to all scientists who have an interest in the experimental and theoretical aspects of the cancer problem An excellent bibliography is provided

—Capt C F Storey MC, USN

The Psychology and Psychotherapy of Otto Rank An Historical and Comparative Introduction by *Fay B Karpf* Ph D Author of American Social P ychology Its Origins Development and European Background et cetera 129 pages illustrated Philosophical Library New York N Y publisher 1953 Price $3

This volume consists of three parts subdivided into eight chapters, a listing of the major works of Otto Rank, and five pages of references The purpose of this volume is essentially to sketch out the development of his (Rank's) deviant views and to present an outline of the essentials of his distinctive posi tion "

Part I is a biographical sketch and presents an account of Rank s role in the psychoanalytic movement Part II deals with a presentation of Freudian, Jungian and Adlerian psychology In Part III the author covers the essentials of Rank's psychology and psychotherapy and describes the distinctive aspects of Rank s personality theory The importance of will doctrine, his approach to the problems of fear, anxiety, dependency, and in security are developed and contrasted to the Freudian position Besides recording the influence of Freud on Rank, the author believes that Rank likewise was a highly important influence on Freud Rank s training was in sharp contrast to Freud's back ground which was narrowly medical in preoccupation so that in this respect they complimented each other

This book is not for the advanced worker in the fields of psychology or psychiatry, but it might prove of value to graduate students in psychiatric social work who draw so much from Rank's contributions By concentrating solely on the profes sional development of Rank, and his work with Freud, and then splitting off to develop his own interests, the author has omitted an area of significance namely, an account of Rank s personal life history and the influence on this work

—Capt H R Weiss USAF (MSC)

Co f c o Drug Add tion Among Ad le c t Th nf t c w e h ld t The N w Y k Ac d my of M d N mber 30 1951 a d M rch 13 nd 14 195 nd w spon or d by the *Comm tt P bl H lth R l t f the N u York Ac d my f M d* w th th s t c f *Th Jos h M cy J F nd t n* 320 p g Th Bl k ston C N w York N Y p bl h r 1953 Pr $4

This is a verbatim record of a series of conferences on drug addiction in which the participating members were recognized authorities in the medical legal sociologic pharmacologic educational religious psychologic and public health aspects of the problem The result is a readable collection of both prepared and spontaneous opinions and comments on this multi faceted and complex condition It will serve to orient those interested in the problem and will acquaint them with the present status of both the medical and social approaches The reader is impressed not so much with what is known but rather with the lack of knowledge on the subject—a fact that is obviously recognized by the discussants

This is an honest and conscientious attempt to crystallize thinking as to what is needed in the prophylaxis detection and therapy of drug addiction with particular emphasis on the adolescent The book s eye-opener potential is its most striking characteristic —*Comdr J B MacGregor MC USN*

N rvou Tr m ion by *Ich j Ta k* M D C rr l l t t f the De f St L M 164 pag llu t d Ch l C Thoma P bli h Sp ngf ld Ill 1953

This book is not for a dilettante or for a quiet Sunday afternoon of casual reading It is filled with facts and figures in a close interlocking of text and numerous illustrations that require concentrated attention and effort for comprehension If one has the incentive and motivation he will find in this thin monograph an excellent review of numerous re earches done over several years on single-nerve fiber preparations to elucidate the physiology of nervous transmission When one reads this scientific report with its excellent bibliography it is difficult to realize that a great amount of the excellent work reported was done in an isolated laboratory where there was a paucity of tools literature or stimulation to such endeavors The greater credit is then due to the worker and to those who encouraged him

The p ing paper and binding are excellent One however may wel astonished at an occasional grammatical slip e g (page 1 word ringer has become a small lettered un pos e positional objective not followed by the word olutio informal speech of the laboratory worker thus gains ec eptance —*A H Lawton M D*

BOOKS RECEIVED

Books received by the U S *Armed Forces Medical Journal* are acknowledged in this department Those of greatest interest will be selected for review in a later issue

Man s Back, by *Theodore A Willis* M D F A C S Formerly Head Department of Orthopedic Surgery St Luke s Hospital Consulting Orthopedic Surgeon U S P H S Hospital Cleveland Ohio Member American Orthopedic Association American Academy of Orthopedic Surgeons Clinical Orthopedic Society Societe Internationale de Chirurgie Orthopedique et de Traumatologie 161 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $9 50

Dermatologic Formulary from the New York Skin and Cancer Unit Service of Dermatology (Dr Marion B Sulzberger Director) edited by *Frances Pascher* M D Revised 1953 150 pages Paul B Hoeber Inc New York N Y publisher 1953 Price $3

Essential Urology by *Fletcher H Colby* M D Chief of the Urological Service Massachusetts General Hospital Associate Clinical Professor of Genito-Urinary Surgery Harvard Medical School Boston Massachusetts Urological Consultant Lakeville State Sanatorium Middleboro Mass 2d edition 650 pages illustrated The Williams & Wilkins Co., Baltimore Md publishers 1953 Price $8

Diseases of the Liver Gallbladder and Bile Ducts Volumes I and II, by S S Lichtmann, M D F A C P Assistant Professor of Clinical Medicine Cornell University Medical College Assistant Attending Physician New York Hospital Adjunct Physician Mt Sinai Hospital Assistant in Post-Graduate Medical Instruction University Extension Columbia University New York N Y 3d edition, revised 1,315 pages 220 illustrations and 3 color plates Lea & Febiger Philadelphia Pa publishers 1953 Price $22 00 for the set

A Clinical Approach to Children s Rorschachs by *Florence Halpern*, Ph D., Assistant Professor of Clinical Psychology New York University College of Medicine 270 pages illustrated by charts Grune & Stratton Inc New York N Y publishers 1953

The Diabetic Neuropathies by *Joseph I Goodman* M D *Siegfried Baumel*, M D *Leonard Fankel* M D Louis J Marcus M D and *Sigmund Wasserman* M D American Lecture Series Publication Number 131 A Monograph in the Bannerstone Division of American Lectures in Endocrinology ed ted by *Willard O Thompson*, M D Clinical Professor of Med cine University of Illinois College of Medicine Managing Editor Journal of Clin cal Endocrinology and Metabolism Editor Journal of the American Geriatrics Society Chicago Ill 138 pages illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $4 75

Mod r Concept s M d c ne by *J l u J ns* Ph D (in M d c ne) U r- ty f M ne ota M R C S (E gl nd) L R C P (L ndon) St. Lo 636 p ge Illustr ted The C V M by Co St L is M p bl h r 1953 P $11 50

Te tbook of E od t by L W t D D S M D F A C. D F A C. S Sc D (Ho) LL D R d by *W ll m F H rr g n,* A B D D S M D P of or f Oral Surgery N w York U y D ector f Or l Surgery Set ic N w York U t ty-Bell ue M di l C e Dir tor f Or l Surgery U ty H p t l Me dowbrook H p tal nd *L W t J* D D S V t g Or l Surg n B ll ue Hosp tal C l mb H p tal 6th s d d t 350 p g 385 illu trat ns d l c lor pl te The C V Mo by C St Lo M publi h r 1953 Pr $8.

H lth nd Huma R lat ns i Germa y R port of th Sec nd Conf c on P blem of H l h nd H m Relat t G m ny The Will rsburg Lodg W ll m burg V Dec mbe 10-15 1950 *Th J s ab M cy J F undat n,* N w York N Y 30 pag

H l h a d Huma Relat ns in Ge many R port f Conf o P bl ms f H lth nd H ma R latt s Ge ma y N T rn P in ton N J J ne 26-30 1950 *Th J h M cy J Fo nd t* New York N Y 207 pag s P $1

H lth nd Huma R l t on R port f Confer nc o H lth d H man R lat n H ld at H dde n N t D tm ld G many A gust 2 7 1951 p sor d by *The J l h M cy J F nd t* New Y k N Y 192 pag Th Blak ton C I c N w York N Y p bl her 1953 P $4

Gl oma P th l gy d Th py by *P l We t* M D A oc t P of or of M d l Oph h lm l gy t th U y f B d pe Ch f f he Ey D pa me t of the J w h H sp l t B d p T l t d by *J l us F ld* M D D plomat f the Am ca Boa d f P th l gy F ll w of Th C ll g f Ame P th l g t D or f Labor tor H l t on S t H p t l nd St Jos ph s Hosp tal H l t P 295 pag Il trat d Th C V M by C S Lou M publ he 1953 P $8

Sh m d G lt P y h nalyt d C ltural S dy by *G h t P* M D S H Memb Th I tut for P ychoanaly Ch c g Ill d *M lt B S ger* Ph D P of or f the Soc l S s C lleg f th U y f Ch g Ch g Ill Fo eword by *R y R C k* M D 86 pag s Ch l C Th ma P bl h r Sp i gf ld Ill 1953 P $3 25

Work g Conf en on Nur ing Ed cat on R port World H l h Org zat on T h l R port Se N 60 30 pag World H lth Org on Ge Sw l d publ h r 1953 Pr $0 20

E pert Comm t on H pat t F t R port W ld He lth Org z t Te hn cal R por Se N 62 26 pag World H lth Org t on G Sw la d publ sh r 1953 P $0 20

A nual Ep d mi l g cal d V tal S t t c 1950 P rt I V tal St t c d Ca of De th 371 pag Illustra d w th map nd g ph World H l h Org t on Ge Sw z l nd publ h 1953 P c $5

E pert Comm on V l l f t on a d T epon matos F urth R port World He l h Org za on T h l R port Se N 63 84 p g Illu ra d World H l h Org on Ge Sw tze l nd publ h 1953 P $0 55

Expert Committee on Insecticides Fourth Report World Health Organization Technical Report Series No 54 98 pages illustrated World Health Organization Geneva Switzerland publishers 1952 Price $0.65

Ballistocardiography The Application of the Direct Ballistocardiograph to Clinical Medicine by *William Dock* B S M D F A C P Professor of Medicine State University Medical Center at New York City College of Medicine Visiting Physician Kings County Hospital Brooklyn Consultant in Medicine Veterans Administration Hospital at Brooklyn *Harry Mandelbaum*, M D F A C P Lecturer State University Medical Center at New York City College of Medicine Associate in Medicine The Jewish Hospital of Brooklyn Physician in Charge Hypertension and Nephritis Clinic at The Jewish Hospital of Brooklyn Attending in Medicine The Jewish Sanitarium and Hospital for Chronic Diseases Brooklyn Attending in Medicine Brooklyn Hebrew Home and Hospital for the Aged Brooklyn and *Robert A Mandelbaum* B A M D Assistant in Medicin The Jewish Hospital of Brooklyn Adjunct in Medicine The Jewish Sanitarium and Hospital for Chronic Diseases Brooklyn Assistant in Cardiology Beth El Hospital Brooklyn 293 pages with 153 illustrations The C V Mosby Co St Louis Mo publisher 1953 Price $9 50

Teaching In Schools of Nursing Principles and Methods by *Loretta E Hildgerkin* R N M S Ed D Associate Professor of Nursing Education The Catholic University of America 2d edition 596 pages J B Lippincott Co Philadelphia Pa publishers 1953 Price $5

Pituitary Chromophobe Adenomas Neurology Metabolism Therapy by *John I Nurnberger* M D Research Associate the Institute of Living and Assistant Clinical Professor of Medicine (Neurology) Yale University School of Medicine and *Saul R Korey* M D Associate Professor of Neurology School of Medicine Western Reserve University 282 pages illustrated Springer Publishing Co Inc New York N Y publishers 1953 Price $7

Sectional Radiography of the Chest by *Irving J Kane* M D Consultant in Chest Diseases U S Naval Hospital St Albans N Y Attending Physician Chest Diseases Lincoln Hospital New York N Y Associate Physician Diagnostic Roentgenology Montefiore Hospital New York N Y Foreword by *Eduard D Churchill* M D 154 pages illustrated Springer Publishing Co Inc New York N Y publishers 1953 Price $7 50

Comparative Conditioned Neuroses by *W Horsley Gantt Howard S Liddell William T James Bernard F Graham, E Gellhorn John L Fuller Curt P Richter George F Mahl Jules H Masserman Curtis Pechtel Livingston Welch O H Mowrer Chester W Darrow Edward J Kempf William G Reese* and *Stephen Fleck*. Originally published in Annals of the New York Academy of Sciences Volume 56 Article 2 pages 141 380 Illustrated The New York Academy of Sciences New York N Y publisher 1953 Price $3 50

Virus and Rickettsial Classification and Nomenclature by Sir *Macfarlane Burnet Ernst Mayr I M Black Francis O Holmes James Johnson C H Andrewes P L Drasset Geoffrey W Rake Mark H Adams A A Bitancourt Harald R Cox J D W A Coles Cornelius B Philip G H Begold Edward A Steinhaus F C Bawden K F Meyer G John Buddingh W McD Hammon Pierre Lepine* and *Albert B Sabin* Originally published in Annals of the New York Academy of Sciences Volume 56 Article 3 pages 381 622 Illustrated The New York Academy of Sciences New York N Y publisher 1953 Price $4

F rst Int rnat on l Sympos um f Y w Contr l World H l h Org n z t on Monog ph Se N 15 418 page illust t d World H lth Org za t on Ge Sw t land publ h r 1953 Pric $4 50

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Books extend our narrow present back into the limitless past. They show us the mistakes of the men before us and share with us *recipes for human success* There s *nothing to be done* which books will not help us to do better They tell us how to live alone and like it or how to be happy though married They teach us to grow thin if fat fat if thin They tell us how to keep accounts repair machines build houses make love bury *our dead till our oil* and lose *our wrinkles* They *inform us* of all things from how to do wrong legally up to how to enjoy God mystically But for this literary enlargement of our narrow present we would be living like monkeys still Books give us information which is indispensable but also insufficient. Knowledge is necessary but *is not enough Life is action* as well as science

—T V SMITH
q ot d *P ig duat M d*

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Contributors who are affiliated with one of the military services in a commissioned enlisted or civilian capacity should forward their manuscripts to the Surgeon General of the Army Navy or Air Force Washington D C in accordance with existing regulations The covering letter should indicate that the author desires the manuscript to be given consideration for publication in this *Journal*

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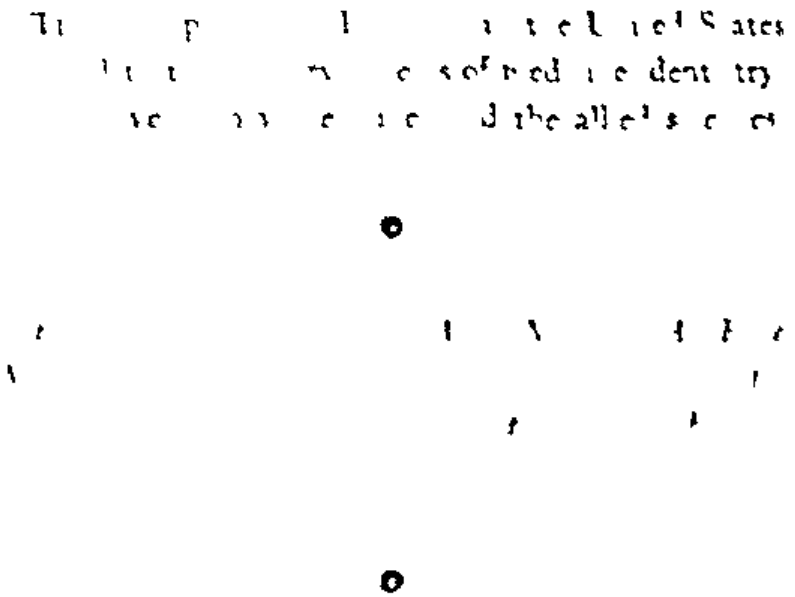
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THE 60th ANNUAL MEETING

Association of Military Surgeons of the United States



NOVEMBER 9 10 11 1945

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PSYCHIATRY IN THE KOREAN CAMPAIGN

A Historical Review (1)

ALBERT J GLASS *Colonel MC USA (2)*

THE abrupt onset of hostilities in Korea confronted us with the immediate task of providing for the prevention and rehabilitation of psychiatric casualties A review of the problems that were encountered during the evolution of the psychiatric program that was established in the Far East Command during the first 15 months of the Korean campaign may prove useful in future planning The material presented is derived mainly from observations made while I served as psychiatric consultant to the Surgeon, General Headquarters, Far East Command, from 1 October 1950 to 30 September 1951 Additional information was obtained from various reports and data in the Medical Section of that headquarters and personal communications with medical and line officers who were in positions of responsibility and command, especially in the early phase of the conflict. For clarity, the various levels of psychiatric activity are reported as related to the several major tactical phases that characterized this period

A history that is written by one of its participants cannot be considered objective This is especially true when an account follows soon after the events have occurred Time is not permitted to show the validity of this or that procedure or decision None of the foregoing is an apology, but rather an explanation so that the reader may more objectively evaluate the report.

THE NORTH KOREAN INVASION AND THE PUSAN PERIMETER 25 June to 15 September 1950

The well equipped and trained North Korean Communist Army suddenly invaded South Korea on 25 June 1950 As they broke through the defenses of the South Korean troops, American and other U N forces were quickly thrown into the battle By 5 July all elements of our 24th Infantry Division had been flown or shipped into southern Korea and were rushed northward to stem the Communist forces The ensuing engagements were fluid

(1) The first of two installments

(2) Brooke Army Medical Center Fort Sam Houston Tex

as the U S and ROK (Republic of Korea) troops u
of delaying actions

Medical service within the 24th Infantry Division
to the initial care and evacuation of patients This
difficult task because of the frequent dislocation an
movements of divisional medical facilities enemy
and guerrilla raids on supply and evacuation cha
a tactical situation rendered impossible and impr
type of intradivisional treatment. The assigned psychi
not function in his specialty but was used as a clerk
commander

On 15 July the 25th Infantry Division moved into ho
ed in 3 days by the 1st Cavalry Division These fre
strengthened our weak position but more enemy divisi
ed and forced a continuation of our withdrawal a
tactics Intradivisional treatment was still impos
was not a serious deficiency that neither the 2
nor the 1st Cavalry Division had an assigned p

Psychiatric Casualties Not Excessive

Psychiatric casualties among United States troop
merous but not excessive Their incidence could co
sidered low in view of the high battle casualty rate
spread by enemy atrocities on the captured and th
the series of apparent defeats the overwhelming su
the enemy in numbers and weapons and the confus
by enemy attacks on our flank and rear Added stress
deleterious effects of physical fatigue caused by th
hot weather lack of sleep and rest, and difficulty
adequate supplies of potable water There were fav
chologic factors Men were forced to fight for survi
far safer to remain with the group than to become
Evacuation of a psychiatric casualty was best acco
a combat unit rather than through vulnerable medica
that were either on the move or fully occupied with th
Moreover it is characteristic for the psychiatric rate
whenever there is a rapid withdrawal perhaps becau
are drawing away from stress Relatively low neuro
casualty rates were also observed in December when
made a similar strategic retreat.

Early in August with the arrival of the 1st Marine I
the 2d Infantry Division the U S resistance furthe
Although limited withdrawals continued the Pusan
gradually took shape to form a definite defensiv
Thereafter our lines held despite repeated heavy a
numerous penetrations by the enemy The almost

fighting in this period accounted for the highest rate of wounded and psychiatric casualties in the Korean campaign The high incidence of killed and wounded in units which were relatively new to combat predisposed to a high rate of psychiatric casualties

As the battle line stabilized, it became possible for divisional medical units to hold and treat mild nonbattle casualties This step was dictated by the desperate need rapidly to rehabilitate a maximum number of casualties in order to hold the thinly manned perimeter defenses Under these circumstances divisional psychiatric treatment began in late August when psychiatrists were assigned to the 2d 24th, and 25th Infantry Divisions and the 1st Cavalry Division Early in September the enemy made heavy assaults at various points of the Pusan perimeter Severe injuries of all types were produced in our forces Intradivisional psychiatric facilities were in full operation and from 100 to 200 patients were being cared for in each of the 4 division psychiatric treatment centers Three of the divisions used the holding platoon of their clearing company for this purpose The 2d Infantry Division formed a provisional type of unit, such as was used in World War II Additional cots, litters, and other needed supplies and personnel were obtained somehow by the respective division surgeons in co-operation with other members of the divisional staff, who quickly became aware of the value of this project.

Many of the psychiatric casualties had a large element of physical exhaustion which was readily relieved by from 2 to 4 days of rest and sleep Other patients, not as numerous, had severe reactions, such as acute disruptive disorders with dissociative states and marked startle reaction Gross hysterical phenomena, such as blindness and paralysis of the extremities, were reported by 2 of the division psychiatrists to comprise 10 percent of their patients Many persons had somatic complaints and showed relatively little overt anxiety, but were hostile toward any effort to remove their symptoms

Use of Drugs

All of the division psychiatrists explored the use of amobarbital sodium or thiopental sodium interviews One claimed that his results by this method were very successful in restoring complete function, particularly in patients with hysterical reactions He promptly returned such patients to combat and stated that there were very few recurrences The other division psychiatrists were not as impressed with the value of barbiturate interviews All agreed that the employment of simple therapeutic methods, such as reassurance, explanation, and ventilation

combined with a regimen of rest, sleep, food and short respite from stress, seemingly accomplished miraculous improvement in their haggard apathetic tremulous and weary patients The division psychiatrist quickly learned that it was necessary to use a firm, matter of fact approach that indicated to the patient in the initial interview that he was not disabled but temporarily worn out that such a reaction was logical understandable and common that he would recover after a few days of rest and be ready for duty In general, the principles of forward psychiatric treatment as stated in Combat Psychiatry were well known by the division psychiatrists and used in their treatment programs

The results of the divisional psychiatric centers were uniformly good they returned from 50 to 70 percent of their patients to combat. The efforts of the 4 division psychiatrists firmly established division psychiatry in the Korean campaign The lessons learned in World War II the reiteration of these principles in training memoranda and other Army publications and the invaluable inclusion of psychiatrists in the tables of organization of infantry divisions resulted in divisional psychiatry becoming operational within 8 weeks after the onset of hostilities in Korea in contrast to the delay of 2 years in instituting a similar program in World War II It is this achievement that spurs us on to plan and make further progress because it disproves the old adage that men learn from history only that men learn nothing from history "

Shortage of Personnel and Supplies

In contrast to divisional psychiatry, the psychiatric effort at army level was meager during this period The 8054th Evacuation Hospital became operational at Pusan on 7 July and served as the major hospital facility for the Eighth Army Very soon this hospital was inundated by a heavy influx of casualties Because of a shortage of medical officers, the assigned psychiatrist had additional duties It was impossible for him to establish an adequate psychiatric program beds were not available for psychiatric patients because only the nontransportable sick and wounded could be held for treatment. He managed to return to duty 10 percent of the psychiatric patients received but had to evacuate 1 800 others to Japan

This period was one of great tension and urgency Medical resources were poor Supplies and personnel were scant. The evacuation and care of the wounded and severely ill got first priority and bed for this purpose were the main concern of responsible senior medical officers The fear that our defenses might be overrun and that helpless patients would be lost to the enemy was ever present. Thus it seemed reasonable to move all patients out of Korea to avoid strategic complications and

keep the medical facilities free to receive the daily load of fresh casualties

Facilities in Japan

The medical facilities in Japan also were unprepared to treat the sudden influx of casualties that began to flow from Korea in increasing numbers Prior to hostilities, Army medical service in Japan barely met the minimum requirements of the occupation troops and their dependents Their resources were further diminished by the transfer of medical personnel to combat units and provisional hospitals that were sent to Korea As the first psychiatric casualties arrived in Japan on 3 July the following psychiatric facilities and professional personnel were available

1 Tokyo The neuropsychiatric service of the 361st Station Hospital (the neuropsychiatric center of the Far East Command) had 200 beds in open and closed wards, an electroencephalograph and an electroshock therapy apparatus The professional staff consisted of 2 psychiatrists, 2 clinical psychologists, and several enlisted social workers and psychometricians

2 Osaka The neuropsychiatric section of the Osaka Army Hospital had a psychiatrist, a psychologist, a social worker and open and closed wards which would accommodate 88 patients

3 Fukuoka in southern Japan The psychiatric section of the 118th Station Hospital had a psychiatrist and facilities for 60 open ward patients

4 The 7th Infantry Division had an assigned psychiatrist.

Because of the proximity of southern Japan to Korea, most of the casualties from Korea were evacuated to the 118th Station Hospital This unit rapidly expanded as it assumed the functions of an evacuation hospital and became the major triage point for the redistribution of casualties to other hospitals in Japan The assigned psychiatrist was caught in the same swirling tide of patients as his counterpart in Pusan He could do little to establish a treatment program because bed space was available only for the nontransportable sick and wounded He was needed to assist in the care and triage of casualties The small professional staff of the hospital often worked 24 hours a day Only 10 percent of the psychiatric patients were returned to duty from this point the remainder were evacuated to the 361st Station Hospital in Tokyo

Arrival of Additional Personnel

In July, the airlift of medical personnel from the United States began to ease the critical shortage of professional personnel On 10 July, 2 psychiatrists along with an internist and a young

medical officer interested in obtaining psychiatric training joined the staff of the 361st Station Hospital As the census of psychiatric patients rose to over 500 in August and September physical facilities at this hospital were expanded to include the detachment barracks

The clinical findings in the psychiatric patients in this hospital were those of the war neuroses and included free-floating anxiety, noise sensitivity major hysterical syndromes and irritable aggressive behavior Observers were impressed by the frequency of severe reactions As in World War II, the Korean campaign demonstrated that the initial severe battle action of combat units not only causes the highest incidence of psychiatric casualties but also the largest percent of severe reactions When units become combat hardened both the frequency and severity of their psychiatric casualties are noticeably diminished This resistance of most veteran combat units is undoubtedly due to the time and battle experience needed to develop group identification to improve communication among the unit members and to obtain the beneficial effects of leadership All of these operate as sustaining forces that prevent the crippling effect of battle fear

The number of psychiatric casualties who had World War II combat experience was also noteworthy It was easy to speculate that such patients were especially sensitive to battle stress because dormant traumatic episodes were revived in a conditioned reflexlike reaction Probably such a mechanism accounted for the prompt breakdown of the relatively few patients who had been removed from combat in World War II for psychiatric reasons For most patients who had served successfully in combat in World War II it was simply a matter of an inevitable statistical result. Most of the troops initially sent to Korea were composed of Regular Army personnel with a high proportion of combat veterans Psychiatric casualties from such a group would necessarily reflect a large percent of soldiers with previous combat experience Many line officers believed that men with former battle experience generally performed better than the newcomers to combat. These officers stressed that the casualties were high because occupation troops were unprepared physically and psychologically for a sudden return to the rigors of severe combat in which they faced overwhelming odds

The noncommissioned or commissioned officers who during World War II had been classified as limited service" for mental or physical reasons were especially troublesome When "limited service" was abolished such persons were placed on a general duty status with their knowledge and consent They did well and usually had received one or more promotions When hostilities

started in Korea they were in comfortable assignments in Japan or the United States When ordered to Korea many, after a few days of combat or while in Japan on the way to Korea, promptly became psychiatric casualties They exhibited marked dependency intermingled with resentment, verbalizing that an implied promise made to them had been broken by the Army which should have known of their limitations and insured their noncombat status It is difficult to suggest a solution to such a problem unless there is established a permanent noncombat category Yet it would be paradoxical to protect and foster a noncombat career for noncommissioned and commissioned officers in an Army whose primary mission is to prepare for and engage in combat when needed Perhaps it would be better for such persons to seek employment in a civilian governmental agency if their primary objective is the security of a federal position

THE UNITED NATIONS OFFENSIVE
15 September to 26 November 1950

At dawn on 15 September, X Corps, composed of the 1st Marine Division, 7th Infantry Division, and various ROK elements, began the amphibious invasion of Inchon The marine elements rapidly secured this port city and pushed on to Seoul On 17 September, 7th Infantry troops landed and moved south to capture Suwon By 19 September, Marine and ROK troops had won control over the Kimpo peninsula, including the large air field, and began the assault on Seoul The reinforced enemy gave stubborn battle for the city, which forced street-by street and house-to-house fighting With the aid of 7th Infantry Division elements, who attacked from the south, Seoul was finally secured on 28 September The marines bore the brunt of the fighting and suffered heavy casualties

Psychiatric casualties from the 1st Marine Division, which did not have an assigned psychiatrist, were numerous All such casualties were evacuated to the hospital ship at Inchon and later to Army hospitals that became operational in the X Corps area The comfort and safety of a hospital ship were not conducive to the return of psychiatric patients to combat hardships, despite its proximity to the combat zone and the fact that the patients were placed under treatment soon after their trauma This is in sharp contrast to the results obtained later at a relatively primitive Army field hospital, where it was possible to return 50 percent of marine psychiatric patients to duty after from 1 to 3 days of rest and simple psychotherapy

The 7th Infantry Division had relatively light battle casualties and consequently few psychiatric casualties resulted. A psychiatric treatment section was included in the divisional clearing company and placed under the charge of an internist because of

the shortage of psychiatrists This deficiency was remedied early in November by the assignment of a psychiatrist

On 16 September the Eighth Army the perimeter defenders reinforced by the 27th British Brigade began an all-out offensive to co-ordinate with the Inchon invasion For the first few days resistance by the enemy was stubborn and some of the most fierce fighting of the campaign resulted By 18 September the enemy strength began to weaken and by 20 September large holes were punched in the enemy defenses Thereafter our mechanized and armoured troops raced northward destroying and disorganizing the enemy forces to join with X Corps troops in an envelopment maneuver which resulted in the capture of many thousands of prisoners and much equipment

The number of psychiatric casualties increased for several days at the beginning of this Eighth Army offensive then dropped precipitously as is usual when victorious troops are rapidly advancing and incurring few injuries The combat troops were far ahead of their medical clearing company In this happy tactical situation the division psychiatric centers could not operate effectively because they were too far in the rear It is fortunate that on such occasions there are few psychiatric patients

On 7 October the X Corps relinquished its sector about Seoul and Inchon to the Eighth Army as it moved to Pusan in preparation for the next amphibious invasion Eighth Army troops continued the attack northward against only slight opposition On 9 October the 38th parallel was crossed Eighth Army troops exploited the tactical situation by passing enemy troops and rapidly advancing in North Korea against some increase of enemy opposition By the end of October U N forces were above Pyongyang where the first serious enemy resistance was encountered On 20 October X Corps elements began landing at the captured city of Wonsan on the coast of northeast Korea and, on 29 October the 7th Infantry Division made an amphibious landing at Iwon 178 miles up the east coast from Wonsan

Morale High

It was not surprising that morale in October was high The table had been quickly and almost miraculously turned and everyone expected that soon the fighting would be over and the return to comfortable Japan accomplished Rumors were rife as to this or that unit returning to Japan The psychiatric casualty rate of October the lowest of the Korean campaign reflected the low incidence of battle casualties and the optimism that pervaded all ranks

The \ Corps forces were increased by the addition of the 3d Infantry Division, the first elements of which disembarked at Wonsan early in November This division was unique in that it arrived with 2 assigned psychiatrists

In November the further gains of Eighth Army and \ Corps became increasingly limited because of stiffening enemy resistance, the difficulties of maintaining adequate logistical support to the forward troops, and the onset of the numbing effects of the North Korean winter With the increasing enemy activity, a moderate increase in the number of psychiatric casualties occurred as the optimism of the previous month began to wane The Eighth Army continued to advance above Pyongyang, and \ Corps expanded its control over a large area in northeast Korea, including the Chosin Reservoir district By 25 November, with the Eighth Army from 75 to 80 miles above Pyongyang and the \ Corps anchored at the Manchurian border on the east, the U N forces were ready for a final offensive by elements of the 7th Infantry Division which was in readiness to wheel westward and co-ordinate with the northward push of the Eighth Army

Surveys of the various divisional psychiatric programs revealed that although division surgeons appreciated the treatment role of the division psychiatrist, they were unaware of or resisted his function in preventive psychiatry For this reason and because most of the psychiatrists were unfamiliar with this aspect of their duties, they remained at their clearing stations and confined their efforts to the treatment and evaluation of referred or evacuated patients To remedy this deficiency, discussions were held with the various division surgeons The division psychiatrists were receptive and eager to implement a preventive program It was agreed that when conditions permitted they would make periodic visits to the various battalions and other divisional units to aid in the psychiatric orientation of units and to establish a spirit of friendly co-operation Whenever possible, the psychiatrists gave indoctrination talks to line officers In general, a program of psychiatric prevention was implemented along the lines set forth in "Combat Psychiatry," *(3)* copies of which were distributed and became the "Bible" of psychiatrists in Korea

Administrative Problems Solved

Two administrative problems, associated with forward psychiatry, were satisfactorily solved in October The *first* concerned the diagnosis of combat psychiatric casualties All types of designations had been used, from shell shock to psychosis, including the ubiquitous psychoneurosis anxiety state This practice caused a similar iatrogenic trauma to patients and the

semantic confusion among medical officers that was present in the early years of World War II An Fighth Army directive was issued implementing the use of the term combat exhaustion " to designate all psychiatric casualties in combat troops as prescribed in current Army Pogulations The *second* difficulty was also resolved when all infantry divisions were directed to submit a biweekly psychiatric report The form used was identical with that used in World War II The divisional psychiatric reports became an important part of the effort to expand the divisional psychiatric program Such reports inevitably pinpointed differences in the various divisional elements and caused commanders to raise questions As in World War II the reports became powerful levers for interest and research in preventive psychiatry

For 10 days prior to leaving the 24th Infantry Division the psychiatrist worked jointly with his replacement During that time the incoming psychiatrist was oriented on local problems and personalities in the division and indoctrinated on the treatment and management of combat psychiatric casualties Visits were made to the various divisional units By this means the departing psychiatrist succeeded in transferring the prestige of psychiatry in the division to his successor who further developed the divisional program This orientation of the incoming psychiatrists became a standing operative procedure

A marked improvement in psychiatric facilities at army level was also taking place The rapid forward movement of the combat troops in September and October left the hospitals in Pusan too far rearward for proper support The 121st Evacuation and the 4th Field Hospitals that supported the X Corps had become operational in the Inchon Seoul area and were better situated to serve the combat troops The 121st Evacuation Hospital ceased operations early in October to move with other X Corps elements to Pusan The 4th Field Hospital remained at its site between Inchon and Seoul Arrangements were made to form a team of 2 psychiatrists in this unit which would serve as an Army center for psychiatric casualties This plan was implemented late in October Adequate facilities up to 100 beds and enlisted medical personnel were made available

The 2 psychiatrists established a treatment program trained the needed enlisted attendants and by the end of October were in full operation They demonstrated that 80 percent of all psychiatric patients received could be returned to duty

On 1 November the 171st Evacuation Hospital became operational for the first time in Pyongyang Because of its forward location it soon was receiving many casualties of all types The assigned psychiatrist began to implement a treatment unit but most psychiatric casualties were sent to the 4th Field Hospital

Plans were made to establish more army psychiatric support in forward areas for the forthcoming U N offensive and a psychiatric team that would operate at the 64th Field Hospital in Pyongyang was selected

Early in November the 121st Evacuation Hospital again became operational at Hamhung and became the neuropsychiatric center for the X Corps The assigned psychiatrist had benefited from his experience at Inchon and had developed an effective treatment unit

Reorganization of Facilities in Japan

A reorganization of psychiatric facilities in Japan was initiated The procedure of concentrating the bulk of psychiatric evacuees from Korea at the 361st Station Hospital proved to have serious disadvantages from the standpoint of treatment and disposition Many of the psychiatric patients were adversely affected by the setting of this hospital and either maintained a stubborn persistence of symptoms or developed more severe manifestations of them than were previously noted This resistance toward improvement and return to duty is not surprising when the comfortable atmosphere of a fixed hospital, situated in peaceful Tokyo, where pleasures abound, is contrasted with the monotonous, primitive, and hazardous existence in Korea In addition, these patients could readily observe and envy the frequent evacuation to the United States of other psychiatric patients who were apparently being rewarded by being sent home for their persistent or severe manifestations of mental illness

It should not be assumed that this apparent reward for illness was in any large degree unconscious to the patients concerned because such matters were openly discussed among them and frequently brought forward by them in their treatment interviews The concentration of patients who had similar battle experiences, symptoms, conflicts and desires at the 361st Station Hospital tended to foster a negative group attitude toward return even to noncombat duty Patients reinforced each other in justifying their complaints and contaminated the new patients with stories that "nothing was being done" for them and indoctrinated the newcomer on what the "score" was in the institution

The psychiatric casualty when evacuated to Japan was especially vulnerable to group suggestion Separated from the positive motivating forces of his combat unit and often tortured by guilt for leaving them, he was figuratively alone with his conflict and readily seized on any support which would aid his symptom defense because it was the only excuse he had for his patient status The group of hospital patients who had similar problems and needs offered him such support Their presence

and numbers gave him some justification for his symptoms and facilitated the projection of painful self directed criticism outward to the hospital personnel and others who had not endured the hardships and stresses of combat and therefore could not appreciate and understand his problems The therapeutic efforts of the psychiatrists were almost wholly directed at reducing the secondary gain factors The irritability of the patient and the doctor would rise as they talked at cross purposes about this or that symptom In truth it was difficult to establish positive rapport for the therapist had little to offer the patient compared with the tangible benefits of remaining disabled Thus the intrapsychic conflict and its manifestations brought about by realistic battle stress were displaced to a hospital setting which became the new battleground as the patient with the support of his hospital fellows fought to maintain the dubious but definite gains of neurotic invalidism

Any efforts to minimize or correct the errors of psychiatric treatment in Japan necessarily were concerned with ways and means of decreasing the admission of ambulatory nonpsychotic mental patients to fixed medical installations The first step in this direction had already been taken by an improvement of the psychiatric program in Korea, particularly the establishing of effective psychiatric treatment at the Eighth Army level This salvaged for duty many patients who previously would have been evacuated to Japan The next step was to limit the transfer of patients to the 361st Station Hospital from other areas in Japan particularly from the 118th Station Hospital in southern Japan which received most of the Korean evacuees This could be done by the institution of a psychiatric consultation and treatment unit in southern Japan Finally it was planned to establish psychiatric consultation and treatment units at various strategic locations in Japan to circumvent the wholesale transfer to the 361st Station Hospital of patients who showed no apparent evidence of organic disease In general the purpose of the entire effort was to decentralize psychiatric facilities to the periphery in order that patients could be treated earlier and as near as possible to the source of their difficulties By this scheme patients from Korea would be evaluated and treated at whatever installation they first reached in Japan Psychiatric problems that arose from troops in Japan could also be treated locally preferably on an outpatient basis In effect the psychiatric program in Japan would duplicate that of Korea where division psychiatrists represented a decentralized method of the treatment near the origin of the patient s emotional conflict Secondary gain factors would then be diminished with a consequent greater effectiveness in therapy The 361st Station Hospital would be retained as a neuropsychiatric center but would be used mainly

for psychoses, severe neuroses, and neurologic or other problems that required full time hospital inpatient care or investigation

The additional psychiatric personnel needed to implement such a program began to arrive early in October when 4 psychiatrists, a neurologist, and a psychiatric social worker were assigned to the Far East Command

Orientation of New Arrivals

The new arrivals were temporarily assigned to the 361st Station Hospital for a period of orientation in the psychiatric problems of the command The aptitude and competence of the recent arrivals were evaluated This period of orientation later became a regular feature for all incoming psychiatric personnel Such a policy made for uniformity in methods of treatment and criteria for the disposition of patients and facilitated the transition from civil to combat psychiatry The fact that most of the new men were relatively young in age and experience, eager to learn, and willing to consider other viewpoints and methods of therapy, made the task of indoctrination far easier than if older and more experienced psychiatrists with fixed opinions and methods had been involved

As part of the intended decentralization of psychiatric facilities in Japan, an arrangement was made early in November to permit the psychiatric section of the 118th Station Hospital to have a minimum of 30 beds for short-term treatment of psychiatric patients

Further efforts toward decentralization were made by assigning an additional psychiatrist, a neurologist, and a clinical psychologist to the Osaka Army Hospital An electroshock therapy machine would enable the enlarged psychiatric facilities to render treatment similar to that given at the 361st Station Hospital The transfer of patients from the Osaka area to this hospital would be unnecessary, especially since evacuation to the United States could be accomplished directly from Osaka

The lack of psychiatric facilities in the Yokohama area was remedied in November by the arrival of the 141st General Hospital which established an outpatient psychiatric consultation and treatment center

Nonconvulsive Shock Therapy

A consultant to the Surgeon General, in neuropsychiatry, arrived in the Far East Command in November for a 30-day visit. He was interested in determining whether nonconvulsive shock therapy was beneficial in the treatment of combat neuroses He had a Reiter type of apparatus and indoctrinated various staff

members of the 361st Station Hospital in the technic of non convulsive treatment Ilis preliminary results were encouraging Twenty patients recently evacuated as combat psychiatric casu alties from Korea were selected and given daily nonconvulsive therapy for from 7 to 10 days About 50 percent of these pa tients showed varying degrees of improvement The psychiatrists of the 361st Station Hospital thought that this type of therapy was of limited value because similar results could be obtained by the usual methods of treatment with less inconvenience to the patients and hospital personnel The only patients available for this treatment were tho e with relatively fixed character disorders aggravated by battle stress Such patients are made even more refractory to treatment by the known gains of psy chiatric illness It was perhaps too much to expect that any rapid somatic therapy could alter basic personalities partic ularly in an adverse environment Patients more suitable for this type of therapy were not available because the incidence of psychiatric casualties was low in October and November and effective forward psychiatric treatment had been established in Korea Psychiatric casualties who possessed relatively good motivation and a more stable personality were returned to duty from treatment units in Korea Those with a more disturbed personality were evacuated to Japan Because of the efficient forward methods of psychiatric treatment it is doubtful that nonconvulsive shock therapy could be of any practical value in the early phases of emotional breakdown in combat The time required for such treatment militates against its success because from 2 to 4 days is the optimum period for the best results in forward areas Even the patients with severe mani festations who were returned to Japan showed more consistent improvement in a convalescent setting than those receiving formal treatment of any type given in a comfortable fixed hospital atmosphere

Study of Japanese Encephalitis

In November a study of the residual cerebral dysfunction from Japanese encephalitis was initiated at the 361st Station Hospital under the supervision of a senior psychiatrist Three hundred soldiers mainly from combat troops in Korea had developed the disease in the late summer and early fall of 1950 Death occurred in 10 percent of these patients The more severely ill had an acute onset with headache stiff neck and fever followed rapidly by an altered sensorium confusion delirium and coma The acute febrile phase was present for from 7 to 10 days during which time constant nursing care attention to nutrition and the insurance of an open airway were crucial in sustaining life In favorable cases the patient s temperature returned to normal by lysis leaving many victims in a more or

less vegetative mental state following which there was a gradual but striking improvement Two hundred patients who had recently recovered from the febrile stage were gathered together at the 361st Station Hospital, and 30 of this group, who exhibited severe loss of mentation, were evacuated to the United States The remainder were exhaustively studied for residual brain damage by neurologic examination, serial electroencephalograms, psychologic tests, and psychiatric evaluation, including a complete background history Most of the patients examined were returned to a limited duty status and were stationed in the Tokyo area After discharge from the hospital, subjects in this study were re evaluated at 3 month intervals for 6 months The common symptoms were headache, irritability, and a feeling of tension, much like those of the well known posttraumatic concussion syndrome Little organic residue was demonstrated After return to duty, the persistence of symptoms largely depended on the adjustment made in their assignment

The severity of the clinical course of the disease bore no relationship to the headache or tension Preillness personality and motivation for duty were apparently the pertinent factors that determined the persistence of complaints Outpatient psychiatric therapy and support were of great value in facilitating adjustment to the resumption of duty The ubiquitous secondary gain in illness was strongly evident in the rehabilitation of these patients and the semantic disadvantages inherent in the word "encephalitis" was an important element

REFERENCE

1 Combat Psychiatry Supplement Number 1 Bull U S Army M Depart Vol 10 Nov 1949

PHYSICIAN POPULATION OF THE NATION

The physician population in the United States reached an all time high of 214 667 in 1952 During last year 151 363 physicians were engaged in private practice, 6 677 were in full time research and teaching 28,366 were interns or residents, or in hospital administration, 20,095 were in government services, and 8 166 were retired or not in practice The increase of 110,700 physicians from 1935 to 1952 has been attributed to accelerated programs in medical schools, expanded medical facilities and the licensure of foreign trained physicians There was a net increase of 2 967 physicians during 1952

SINGLE STAGE ENDODONTIA

HARRY QUINT J *Capt n, DC USA*

PROBABLY the most common deterrents to the closed endodontic therapy are the number of patient sittings necessary to render the canal sterile and the exacting operation of its obliteration by filling Since the introduction of root canal therapy many methods have been devised for sterilizing the canal the latest and probably the most effective being the use of nti biotic pastes

Although securing a negative culture by this method is not a great problem the endodontist must spend 2½ hours of chair time in treating and filling the root canal of an anterior tooth This is still almost as tedious and exacting an operation to the average practitioner as it was in the early days of endodontic therapy

In the military service it is not practical for patients to make numerous prolonged visits for root canal treatments prior to its obliteration by filling Training schedules and other duties interfere so that root canals under treatment frequently cannot be cultured and medicated as scheduled and the shortage of dental personnel precludes this time consuming treatment

As a consequence many nonvital and infected teeth are justifiably extracted because if left untreated they might be detrimental to a soldier s health and impair his military proficiency at a time when he is most needed

No prosthesis can match the comfort and efficiency of a natural tooth and in many patients whose oral hygiene is poor such an appliance may increase caries and aggravate disturbances of the investing tissues Nonetheless many prostheses are constructed at great cost to the government.

Anterior tooth prosthesis may often be avoided by the application of root canal therapy and in many patients if prosthesis is necessary strategic abutment teeth can be safely retained for a partial denture Often the retention of a cuspid tooth in the arch will determine the difference between a successful or an unsuccessful partial denture

An endodontic technic that will aid in solving these problems and save time for the dentist and the patient and money for the

F m M d ga A my H p l T m W h

government is here presented With it endodontic therapy on single rooted teeth may be completed in one sitting With a minimum of experience the dentist should be able to perform the operation in about 1 hour of chair time This is less time than would be spent in the construction of a simple prosthesis

INDICATIONS

The technic is indicated for any nonvital or infected single-rooted tooth unless contraindicated by (1) deep periodontal pockets which approximate or communicate with the apical area, (2) too close proximity of anatomic structures such as maxillary sinuses to the apical area (3) acute inflammatory conditions in the area, and (4) debilitation of the patient.



Figure 1 Model showing the extension and position of the flap and the opening to the apex through the labial plate

Fistulas, cysts, and granulomas which may involve large root areas have not proved to be contraindications nor has abnormal mobility of a tooth due to inflammation of the apex

TECHNIC

The area is anesthetized The pulp chamber of the involved tooth is opened and cleaned to minimize subsequent darkening due to decomposition of pulpal tissues The root canal is reamed and opened to as near the apex as possible A semilunar incision is made for good access to the area to be exposed The soft tissue and periosteum are reflected and the cortical plate exposed Using the preoperative roentgenogram and the length and inclination of the reamer in the root canal as a guide, the apex of the tooth is approximated and the cortical plate over the apical area removed (fig 1)

After the apical area is cleansed of debris, the reamer is advanced through the apex and the reaming of the canal is completed With from 2 to 5 cc of a 1 3,000 solution of benzalkonium chloride the canal is irrigated from crown to apex The

aspirator tip is kept at apex during irrigation (fig 2) Using a ramrod action the walls of the canal are scrubbed with phenol then alcohol on a broach tipped with cotton A dry broach is

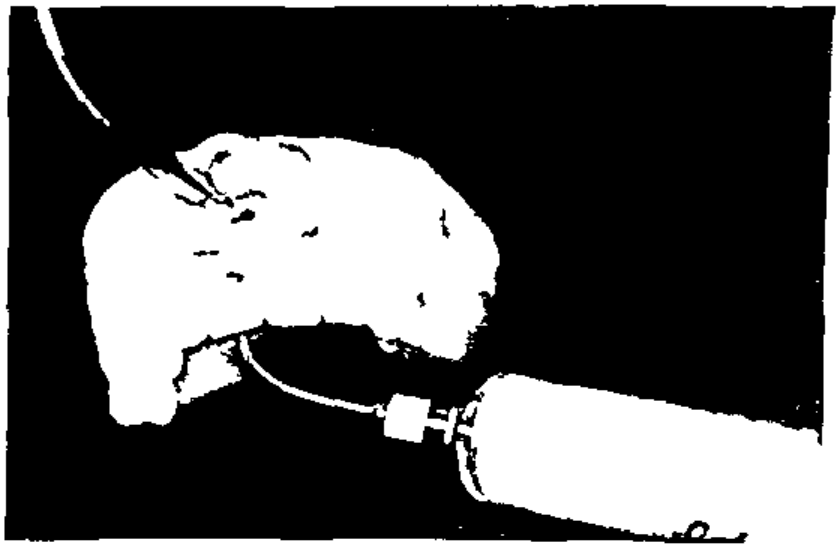


Figure 2 Flushing the canal

placed in the canal and left in place (fig 3) The tip of a jiffy tube of chloropercha is inserted as far apically as possible The cotton apical plug is removed and the tube squeezed until some

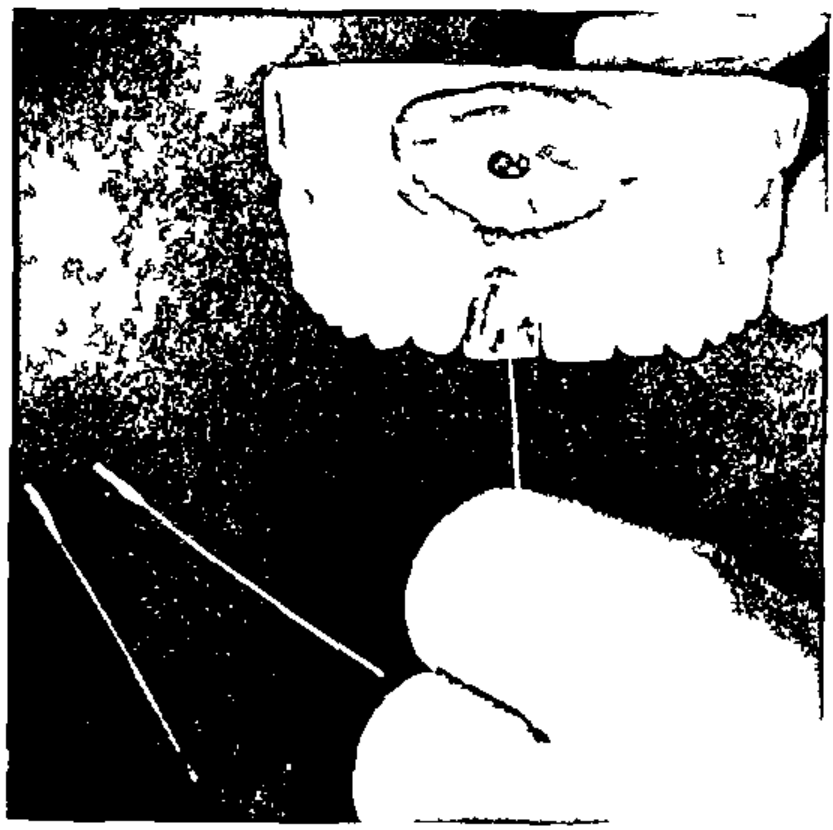


Figure 3 Use of the tipped broach

chloropercha oozes from the apex The tube is removed slowly as the material is squeezed into the canal This should fill the canal (fig 4) Now as many gutta percha points as possible are placed in the canal The filling material is condensed with gutta percha points until no more excess exudes from the apex Any excess at the apex is removed and the root tip is burnished and sealed The apical area is cleaned the labial surface is packed with sterile gauze, and a roentgenogram is taken If this shows a well condensed canal filling and a clean apical area, the filling material is removed from the pulp chamber A light colored cement is placed over the canal and the labial plate of the crown and the incision is closed The lingual surface of the crown is restored with amalgam

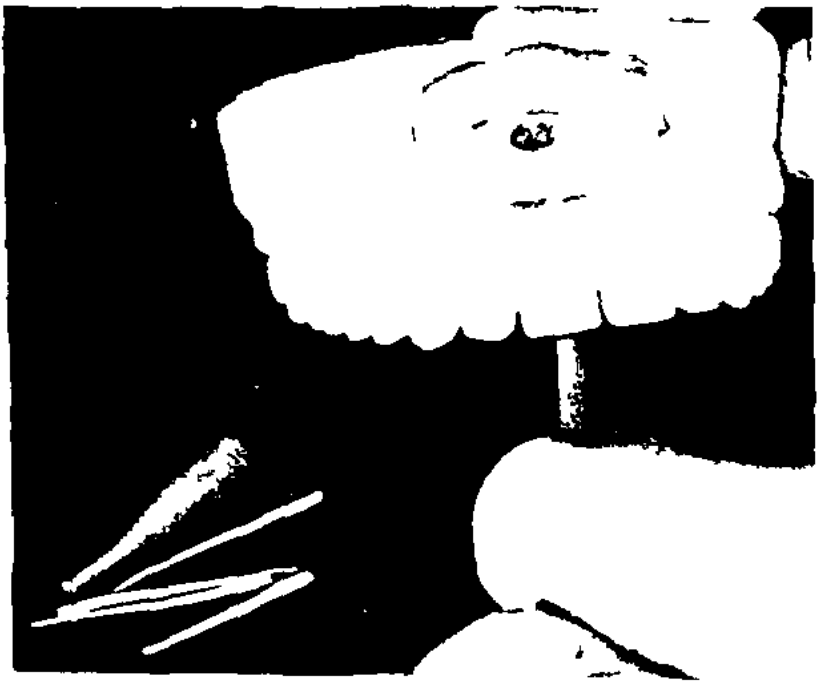


Figure 4 Placing the chloropercha in the canal by means of a Jiffy tube Jiffy tube and gutta percha points are shown at lower left

DISCUSSION

In acute inflammatory conditions, the tooth should be opened for drainage and the occlusion relieved The filling operation should not be performed until the acute inflammation has subsided Adequate antibiotic therapy should be started on the day prior to and continued through the day after the operation Clinical results in chronic cases have been equally good without antibiotic administration

Whenever the root contour and the access allows adequate curettage and reaming, the roots should *not* be amputated at the level of sound bone This is not a routine apicoectomy technic If the access is adequate, curettage of the bone and

root surfaces is all that is necessary Clinical and radiologic evidence show the regeneration of sound periodontium and bone around roots that have been denuded by apical pericemental lesions

Some authorities [4] stated that a normal radiologic appearance of the bone and periodontium indicates a histologically normal condition

Ice packs placed intermittently on the face over the operative area for from 2 to 4 hours postoperatively will minimize edema Little or no postoperative pain is experienced by the patient If granulomatous areas are encountered pain from curettage may be prevented by injecting 2 percent lidocaine with a 1 50 000 solution of epinephrine into the area

The technical advantages of this procedure over that of first reaming and filling the canal and then opening the apical area for curettage or apicoectomy are that (1) no time is needed at the beginning of the reaming operation for roentgenographic calibration of the canal s length (2) a hook or twist of the canal at the apex does not interfere with the final reaming operation because these obstructions can be eliminated by apicoectomy prior to the final cleaning of the canal (3) the canal may be flushed from crown to apex facilitating the cleansing of its wall (4) the apex of the tooth can be located more accurately

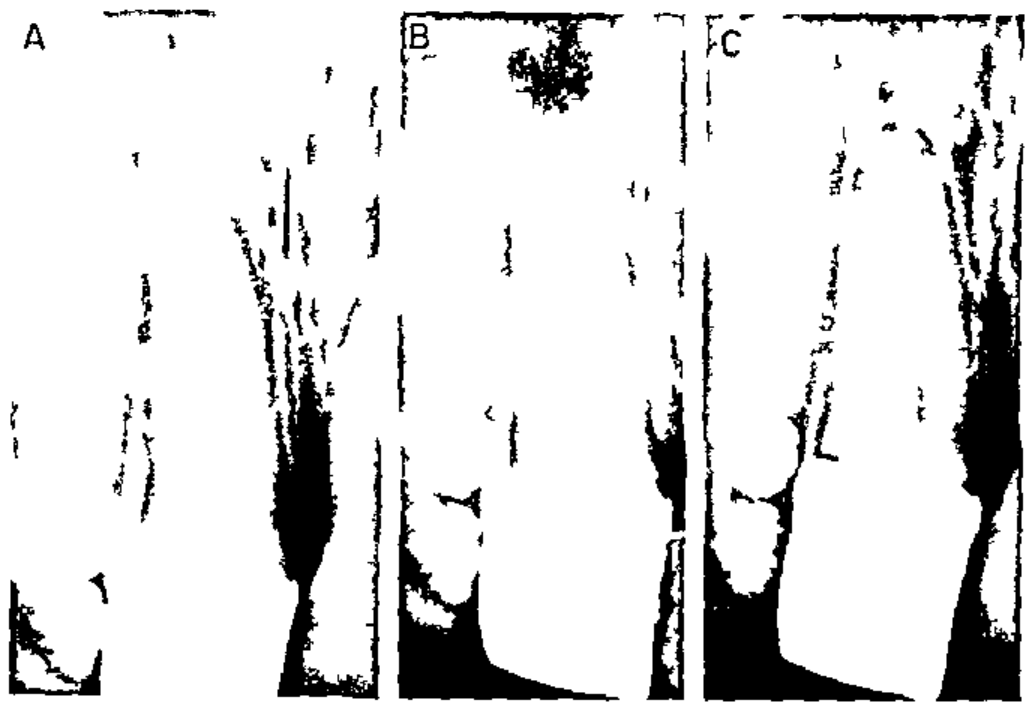


Figure 5 (1) (A) Preoperative roentgenogram immediately after operation. (C) Roentgenogram taken 11 5 months after operation

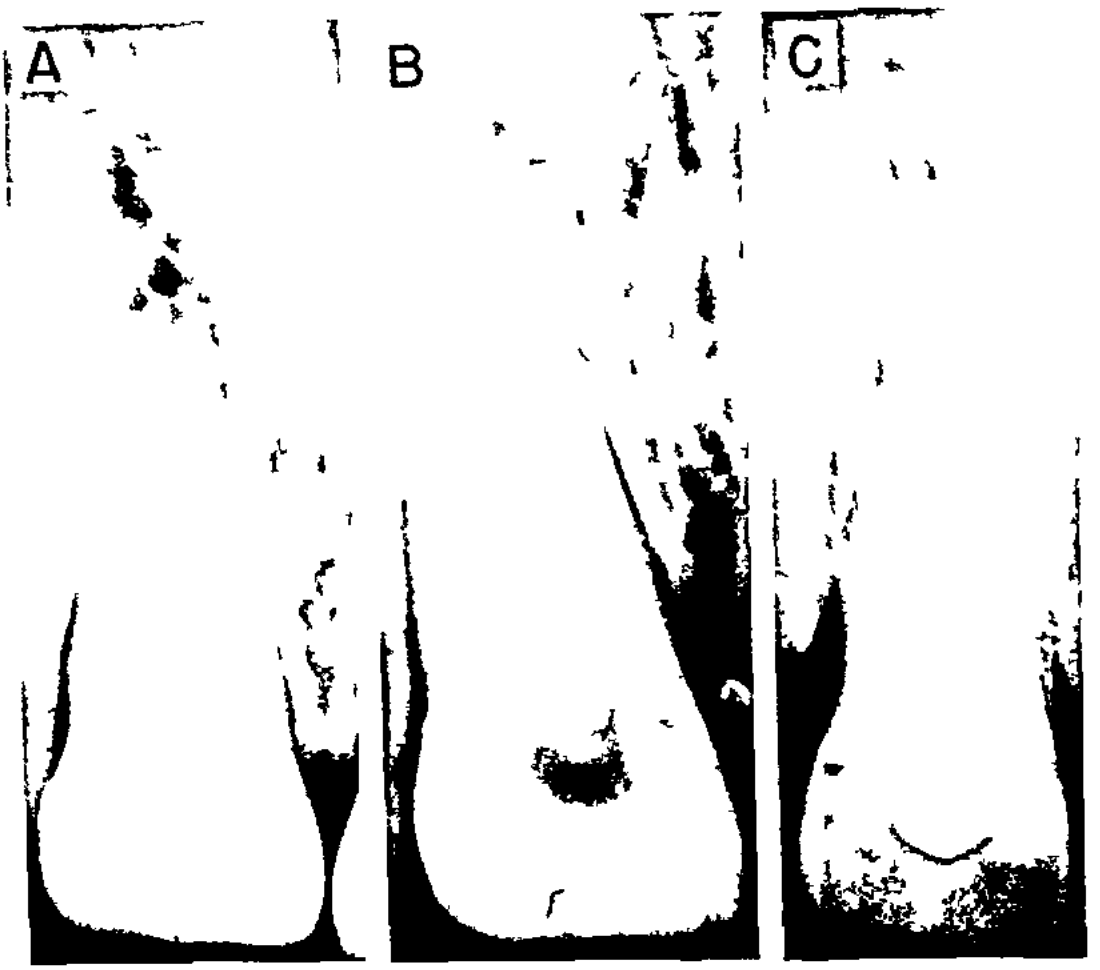


Figure 6 (case 2) (A) Preoperative roentgenogram. (B) Roentgenogram taken immediately after operation. (C) Roentgenogram taken 14 months after operation.

prior to the removal of the labial plate by noting the length of insertion and the inclination of the reamer in the canal, and (5) the apical seal of the canal can be checked visually by the operator at the time of placing the filling material

CASE REPORTS

Case 1 A 17 year-old soldier had an intense toothache and generalized cellulitis of the midsection of his face Apical involvement of the upper left central incisor, which was painful on percussion and mobile through an arc of 3/8 of an inch, was noted The root canal was opened through the lingual surface of the crown for drainage The lower anterior teeth opposing the involved tooth were ground to relieve hyperocclusion An injection of 300 000 units of procaine penicillin was given daily for 4 days The endodontic operation was accomplished on the third day of this treatment A large area of bone destruction was found at the apex The apex and the bony crypt were curetted and the flap sutured Progress was uneventful and the tooth quickly lost its excessive mobility (fig 5)

The other upper incisors presented a poor prognosis for prosthetic abutment because of their excessive mobility large pulps and extensive previous restoration Loss of this involved tooth would have indicated a cuspid to cuspid prosthesis—an involved and time-consuming operation

Case 2 A 25 year old man on routine examination was found to have a darkened upper left central incisor A roentgenogram showed a well inscribed apical radiolucency The tooth was asymptomatic and nonvital Endodontic treatment was completed in one sitting No antibiotics were administered and healing was uneventful (fig 6) This patient presented no prosthetic problems either from a mechanical or esthetic standpoint The final result was better than the finest prosthesis

Case 3 A 25 year old woman presented a chronically draining oral fistula about 10 mm above the gingival crest and between the central and the lateral incisors Roentgenograms showed a large apical radiolucency of the involved tooth The patient was given 300 000 units of procaine penicillin daily for 3 days The operation was performed on the second day There was a large area of bone destruction at the apex involving about one third of the dental root About 3 mm of the apex was removed because of its pitted and eroded surface Healing was uneventful (fig 7) Here prosthesis was circumvented eliminating a per

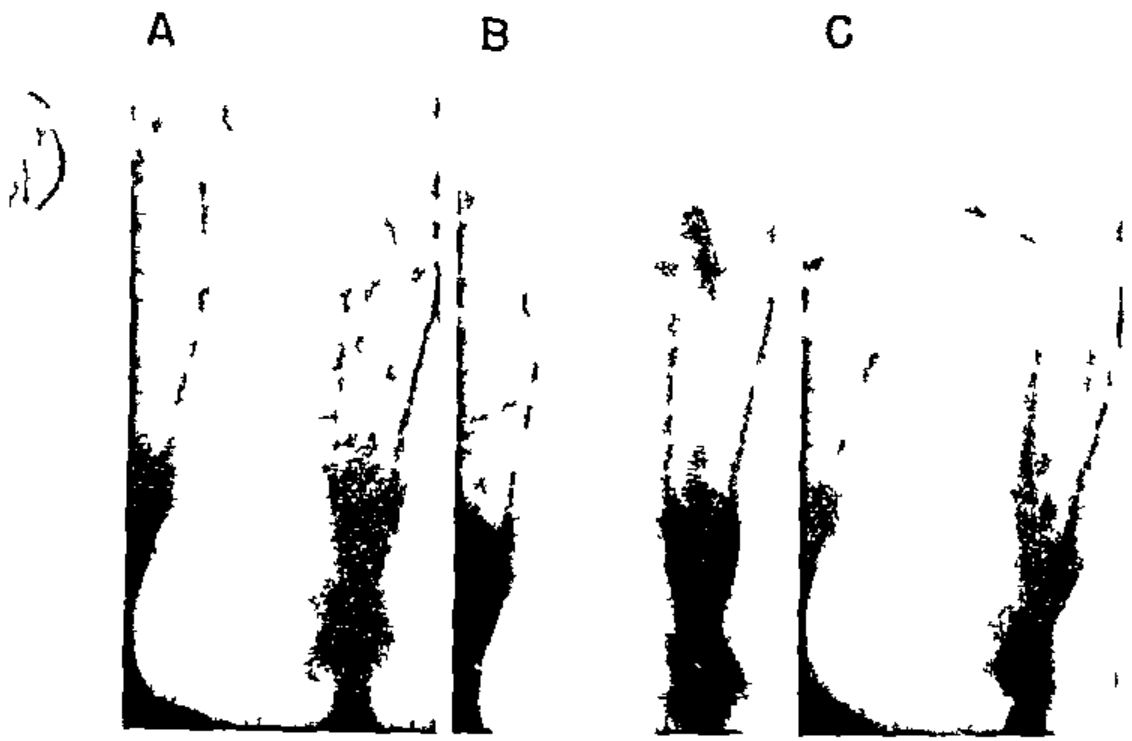


Figure 7 (case 3) (A) Preoperative roentgenogram. (B) Roentgenogram taken immediately after operation (C) Roentgenogram taken 8 months after operation

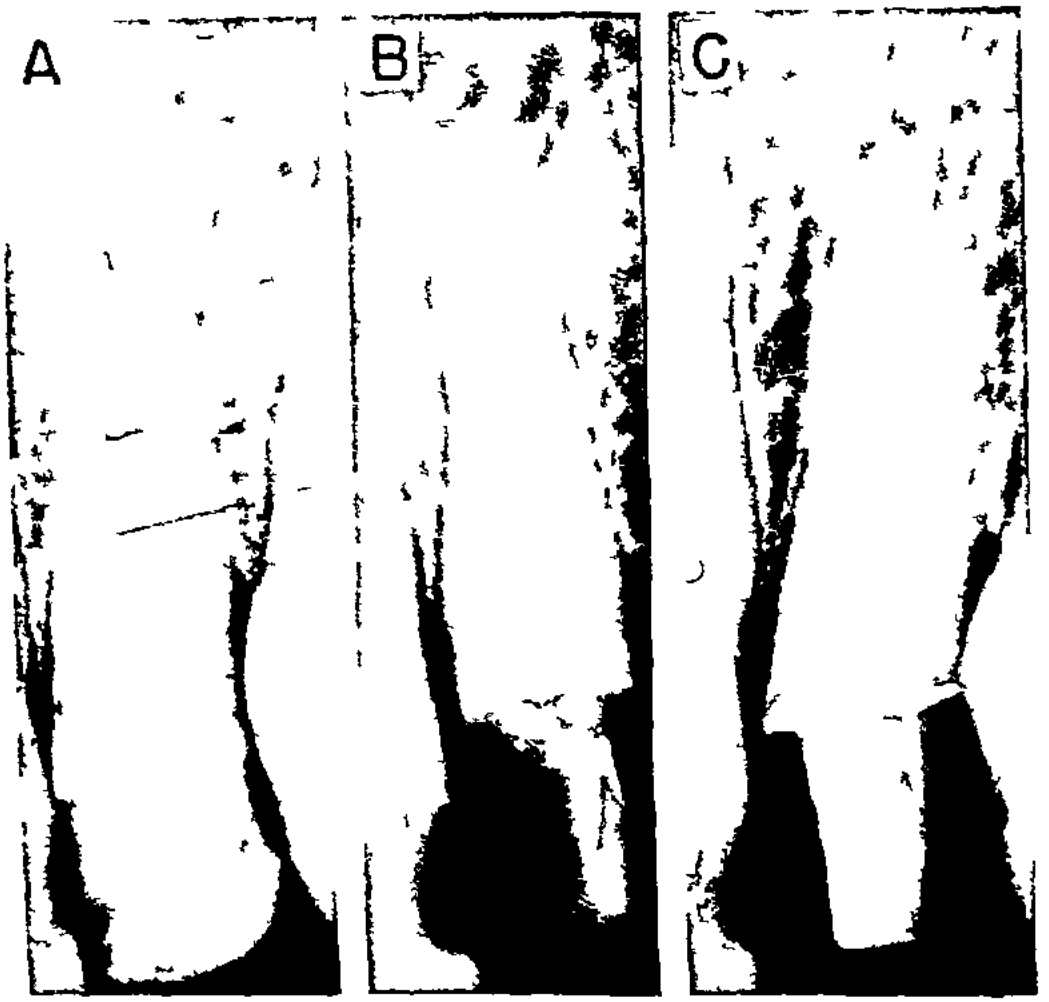


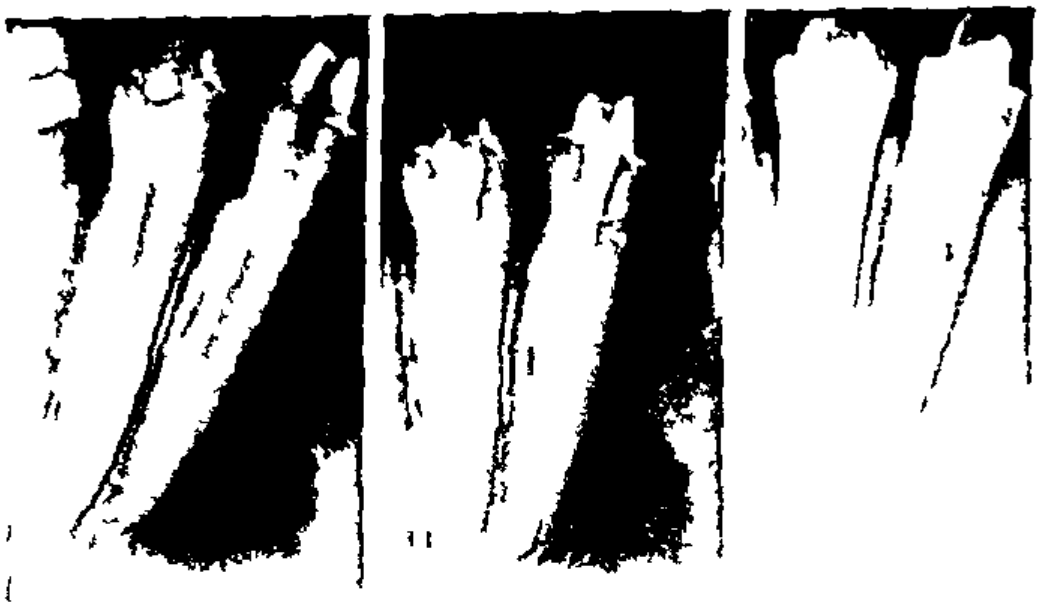
Figure 8 (case 4) (A) *Preop rative roentgenogram.* (B) *Roentgenogram taken immediately after operation.* (C) *Roentgenogram taken 9 monibs afte operation.*

plexing problem to the prosthodontist and saving time for him and the laboratories

Case 4 A 30-year old woman had an acute toothache aggravated by percussion and localized in the upper right lateral incisor Vitality tests were negative and roentgenograms showed no apical involvement The crown of the tooth was opened for drainage and the remains of the pulp removed The root canal was left open for drainage The patient was given 300,000 units of procaine penicillin daily for 3 days When the acute symptoms had subsided the endodontia was accomplished No apical bony destruction was found and the apical curvature was removed to facilitate reaming the canal Healing was uneventful (fig 8) Although this tooth could have been replaced with a fixed prosthesis, its preservation in the arch allowed a more favorable restoration from an esthetic standpoint

Case 5 A 23 year old man had pain and sensitivity to percus ion in the lower right central and lateral incisors with

swelling of the labial surface of the alveolar process and crepitation Roentgenograms showed a large cystic area involving the apexes and roots of these teeth The crowns of the teeth were opened and a purulent discharge was observed The patient was given 300 000 units of procaine penicillin and 0 5 gram of streptomycin daily for 7 days When tenderness subsided



A B C

Figure 9 (case 5) (A) Preoperative roentgenogram (B) Roentgenogram immediately after filling canals (C) Roentgenogram 6 months after operation

on the fourth day the operation was performed A large area of bone destruction was present around the dental roots the apical half of the roots were completely denuded and the labial plate over these areas was destroyed The root and bony crypt surfaces were curetted and the incision sutured after the canal fillings were placed Healing was uneventful (fig 9) Making a partial prosthesis for this patient would have been almost impossible The teeth remaining were short conically shaped and spaced so that any attempt at prosthesis would have given a poor mechanical and esthetic result

SUMMARY

The simplified practical and successful method of root canal therapy here described results in a great saving of the dentist's time With very little experience in this technic the average operator can become proficient enough to complete the operation in 1 hour of chair time Endodontia besides being an

important service to the patient, can become interesting and enjoyable to the dentist No special equipment or materials are needed beyond those available on the supply table or those found in the usual dental office

The procedures of reaming, cleaning, and filling of the root canal are reduced to simple operations, as are the condensing and sealing of the filling material at the apex of the tooth Whether the canal is contorted or wide open at the apex makes little difference to the operator when this technic is used In military dentistry more anterior endodontia would result in fewer prostheses being made, thereby benefiting the soldier functionally and esthetically and the government financially

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Future of Electrocardiography

On superficial examination it would not seem that any further progress can be made in electrocardiography True, vectorcardiography has enjoyed a renascence, and the spatial vector method of synthesis of surface leads has proven useful in diagnosis and teaching But the latter is merely a way of visualizing, and the former a method of presenting the same electrical information provided by conventional leads Neither is likely to add much of value diagnostically, although both have added a great deal to our understanding of the genesis of the deflections seen in the leads usually recorded in the clinic * * * The history of scientific endeavor has repeatedly shown the hazard of predicting that progress in any field of investigation is no longer possible The belief that the end of productivity in electrocardiography came in 1924 has since been proven to be the grossest sort of error Those most responsible for reversing the miscalculation were the late Doctor Frank Norman Wilson and his associates

—CHARLES E KOSSMAN Colonel USAFR (MC)
in the *American Journal of Medicine*

MILITARY ASPECTS OF THE DIAGNOSIS OF EPILEPSY

HENRY S COLONY *Commander MC USN*

BERNARD I KAHN *Commander MC USN*

THE grand mal seizure which may be a diagnostic symptom of epilepsy is rarely found in the young man who first enlists in the Armed Forces Epilepsy however is of particular importance in the military service The inability to prophesy or gage the magnitude of seizures must of necessity curtail the type and variety of duty as well as the locale of the soldier sailor or airman However loyal or patriotic he may be he cannot be trusted around machinery to work as a driver to handle artillery or participate in active combat

Not all convulsions are epileptic in origin their etiology offers a differential diagnostic problem to the physician for it may vary from hypoglycemia to hysteria

When a patient is hospitalized for determining the cause of his convulsions the burden of proof is on the military physician to establish the diagnosis of epilepsy It is not merely of diagnostic or military importance but has a unique socioeconomic importance to the tax paying public The Career Compensation Act of 1949 states that only persons with service connected disabilities are awarded monetary compensation This Act further provides that those with a service connected disability of less than 30 percent will receive compensation in a lump sum of 9 months base pay up to 10 years Service connected disabilities of 30 percent or more receive a proportional amount of base pay monthly up to 75 percent in a form of retired pay Those who are temporarily retired never receive less than 50 percent but their cases are reviewed every 18 months In the event no substantiating evidence concerning convulsions prior to service can be elicited it is logical to assume that the epilepsy was service connected It is an obligation to the tax paying public therefore as well as for the good of the service diagnosis should be made at the earliest possible time

From U S Naval Hospital Oakland California Submitted for publication March 2 1952

In 1951 there were 471 admissions to the neurological department of this hospital of which 125 (26 percent) were admitted with a diagnosis of questionable epilepsy Because of the magnitude and importance of this problem a series of diagnostic procedures have been devised to segregate those patients who do not have true epilepsy

METHOD

The diagnostic program includes the following blood counts urinalysis, blood serology, spinal fluid examination, roentgenograms of the skull, determinations of serum cholesterol and serum calcium, glucose tolerance test, and a series of electroencephalograms If the glucose tolerance test demonstrates a flat curve or a significant decrease in the blood sugar, it is followed by an insulin tolerance test After a fasting blood sugar specimen is drawn, 0 1 unit of regular insulin per kilogram of body weight is given intravenously and blood sugars are taken at 5, 20, 45 60 and 120 minutes following the insulin concurrently an electroencephalogram is made to correlate blood sugar levels with abnormalities which might appear on the tracing The series of electroencephalograms includes 4 successive tests followed by a metrazol (pentylenetetrazole) activation and if indicated, an amytal sodium (amobarbital sodium) sleep-tracing Metrazol activation is performed by giving up to 300 mg of metrazol intravenously at the rate of 100 mg per minute during the test. This method has proved to be eminently satisfactory Amytal sodium sleep-tracings are considered to be indicated when there is a question of temporal focus or when the convulsions are primarily nocturnal. The method is to inject 0 487 gram of amytal sodium intravenously while the test is run.

The figures given in table 1 were obtained from 1 January 1951 to 1 January 1952 The were compiled to evaluate the efficacy of the current methods in use at this hospital in the attempt to prove or disprove the diagnosis of epilepsy Of the 119 patients admitted for suspected epilepsy 78 were discharged from the service with a diagnosis of epilepsy 41 were either returned to duty or transferred to the psychiatric ward or elsewhere in the hospital

In our interpretation, "verified epileptic" implies that the accumulation of data from the history laboratory work, and electroencephalograms leaves no reasonable doubt that the patient is a true epileptic If his electroencephalogram is abnormal but seizures or aftereffects of seizures have not been witnessed, he is returned to duty not classified as an epileptic As a general rule a statement that there was not sufficient proof to verify the diagnosis was made part of his record if any subsequent

TABLE 1 *R lt f al l ct oe ph l gr m*

D g	P t nt w h b m l y	P t w th b ormal ty d on/w th							Total pat t
		F t t t	S d t	Th d	F th t	Amy l d um	I s li	M t l	
No f d pl pt	26	4	4	0	1	0	1	5	41
V f d pl p	8	32	11	5	2	1	1	18	78
G d m l	8		8	5	2	1	1	14	66
P t m l	0	2	2	0	0	0	0	3	7
P y h m t	0	3	1	0	0	0	0	1	5

seizures occur, they should be recorded If an adequate description of a seizure is submitted, it is considered acceptable whether witnessed by a physician, members of the family, or shipmates

Of the total number of verified epileptics, 66 were diagnosed as grand mal, 7 petit mal, and 5 psychomotor types In the electroencephalograms of verified epileptics, 8 did not exhibit abnormal tracings, but 32 revealed an abnormality in the first test 11, for the first time on the second test, 5, on the third, and 2, on the fourth One patient given amytal sodium, 1 with insulin tolerance, and 18 with metrazol activation tests also had abnormal electroencephalograms Of those whose diagnosis was not verified, 26 showed no abnormalities 4 showed an abnormality for the first time on the first test, 4, on the second, none, on the third 1 on the fourth 1, with insulin tolerance and 5, with metrazol activation Among those with grand mal epilepsy, 8 had no abnormalities, 27 had abnormalities on the first test 8, on the second, 5, on the third, 2, on the fourth 1, with amytal sodium, and 14, with metrazol activation In patients with petit mal epilepsy, the first abnormality occurred in 2 on the first test, 2 on the second, and in 3 with metrazol activation The abnormality occurred in patients with psychomotor epilepsy on 3 occasions in the first test, 1 on the second, and 1 with metrazol These figures tend to show that about one half of the epileptics will show an abnormality for the first time in subsequent tests About one-fourth of the total number demonstrated the first abnormality with metrazol activation The 5 nonverified epileptics with metrazol activation correlates with the number who demonstrated abnormalities in the first and second tests

SUMMARY

Although epilepsy always presents a diagnostic problem, in the military service it is of particular importance not only because of the monetary considerations but also because the burden of proof rests upon the military physician For these reasons, our admissions for a period of 1 year were reviewed A brief description has been given of the diagnostic procedures in use These procedures include four successive electroencephalogram tracings followed by an activated electroencephalogram The records reveal that the custom of taking only one electroencephalogram to rule out epilepsy *results* in many cases in misleading information The use of activated procedures has proved to be of definitive value

272709 O 53 3

Green Wave of Chlorophyll Ebbs

No doubt the time will be short till the green wave of chlorophyll that threatened to inundate the United States will begin to ebb Chemists at Glasgow University have been testing chlorophyll against the smell of skunks perspiration chopped onions garlic and foul gases and conclude that it has no deodorant properties whatever This result was predicted in *Postgraduate Medicine* well over a year ago when the wave first began to rise Dr John C Brocklehurst of the Department of Materia Medica at Glasgow worked out a test in which mercaptan the foulest gas he could find, was passed through tubes of chlorophyll and then through a reagent iodine so that it could be found how much of the foul smelling gas had been absorbed by the chlorophyll Dr Brocklehurst observed as reported in the *British Medical Journal* that just as much of the gas was absorbed by water as by chlorophyll Similar tests were made with other offensive odors

In a final test Dr Brocklehurst and his associates swallowed more than 25 times the number of tablets of chlorophyll recommended as an ordinary dose and found that the characteristic odor caused by asparagus in the urine was not removed nor was there any effect on the odor of perspiration from the armpits

The announcement from Great Britain caused consternation among the purveyors of chlorophyll as a deodorant in the credulous United States They met in New York City as reported by the New York Times and apparently did not wish to take this announcement lying down Nevertheless Dr Sam Granick of the Rockefeller Institute for Medical Research said that the United States extractors of chlorophyll do not have a leg to stand on in claiming that a pill taken by mouth can deodorize This statement was agreed to by Dr A H Corwin head of the Department of Chemistry at Johns Hopkins University Indeed he asserted that chlorophyll masks odors because of the mixtures that are sold Mixed with licorice the smell is like licorice and mixed with mint the smell is like mint it is the odor of the substance added that masks the odor that is said to have disappeared because of the chlorophyll

Apparently the only joy to be derived from the current situation is that of the growers of alfalfa who sold 40 000 tons of high grade alfalfa last year for making chlorophyll

As one views the current situation one is impressed by the fact that these waves of enthusiasm come oftener nowadays but they also disappear faster

—MORRIS FISHBEIN M D
Postgraduate Med

TREATMENT OF NEUROGENIC BLADDERS WITH BANTHINE

RICHARD M FENNO *Major USAF (MC)*

CLAUDE C DODSON *Colonel MC USA*

THE action of quaternary ammonium salts on the bladder has been known for some time Nesbit and his coworkers[1] in 1947, reported the effects of tetraethylammonium chloride on the urinary bladder A new quaternary ammonium derivative, methantheline bromide (β diethylaminoethyl xanthene 9 carboxylate methobromide, commercially designated as banthine), has an action on the bladder which is similar but less marked In small amounts banthine inhibits postganglionic cholinergic activity and in larger doses blocks the transmission of impulses through the autonomic ganglia In still larger doses it has a curarelike effect Prompted by observations on elderly patients undergoing treatment for peptic ulcer with banthine,[2] wherein a slightly hypertrophied prostate resulted in complete urinary retention while they were taking banthine, an effort was made to determine how much effect, if any, the drug would have on the spastic types of neurogenic bladder in paraplegic patients at this hospital

METHOD

The Lewis cystometer was used in making the diagnosis and in following the course of patients with spastic bladders who were treated with banthine The first step was to determine at what stage the bladder's condition became stabilized This was important because the drug is contraindicated during spinal shock and in the treatment of the autonomic and reflex paralytic types of bladder

Filling of the bladder was in increments of 50 cc in all but one patient in whom increments of 25 cc were used Heizur and Hodges[3] filled the bladder at a continuous rate of 50 cc per minute, instead of by increments This was thought to produce a more physiologic cystometrogram, but the method of 50 cc increments served our purpose and as a uniform method The uninhibited neurogenic bladder was found to respond the best and the pure reflex bladder the least of the spastic types of

From Brooke Army Hospital Fort Sam Houston Texas

bladder tested These results agreed with the findings of Lapides and Dodson and of Keizur and Hodges

Our clinical criteria for the use of the drug were (1) a spastic type of neurogenic bladder which had reached a stable stage (2) absence of stones or infection (3) absence of obstruction and (4) a normal cardiovascular system Glaucoma severe cardiovascular disease and myasthenia gravis are contraindications After sufficient cystometrograms were obtained to make the diagnosis of a stabilized spastic neurogenic condition our procedure was to inject from 50 to 100 mg of banthine intravenously Ten minutes later the cystometrogram was repeated and this furnished prompt and reliable information of the effect of the drug Frequent blood pressure and pulse determinations were made during the injection which was done slowly If the systolic blood pressure rose above 140 or the pulse above 120 the drug was discontinued The amount given at this time determined the subsequent oral dosage although in no case was more than 100 mg given intravenously The oral dosage was then adjusted symptomatically and although it caused no significant change in blood pressure in our patients the pulse and blood pressure both rose markedly when banthine was given intravenously In no patient, however did the pulse and blood pressure remain elevated beyond a period of six hours

CASE REPORTS

Case 1 A 21 year old man who had sustained a compression fracture of his twelfth thoracic vertebra in Korea was evacuated to this hospital and a laminectomy was performed on his vertebrae from the tenth thoracic to the second lumbar inclusive When first seen on the urology service in July 1950 a markedly hypotonic bladder with a flat curve was noted He was given the usual parapleme care and had a continuous indwelling catheter until December Litholapaxy was performed on two occasions for the removal of bladder calculi and in December a markedly hypertonic bladder of the uninhibited type was noted (fig 1A) Ten minutes following the intravenous administration of 100 mg of banthine the patient presented a more nearly normal cystometrogram (fig 1B) He was thereafter maintained on 100 mg of banthine by mouth every six hours and the indwelling catheter was withdrawn Prior to the administration of banthine when the catheter was withdrawn it was necessary for him to have a urinal in place constantly because of micturition on the average of every five or ten minutes Following the intravenous and oral administration of banthine he was able to retain his urine and void every two or three hours with warning sufficient to have a urinal in place Previously he had had no sensation prior to precipitate micturition In February 1953 he consented to a therapeutic test. The drug was withdrawn for three days At the end of this time con

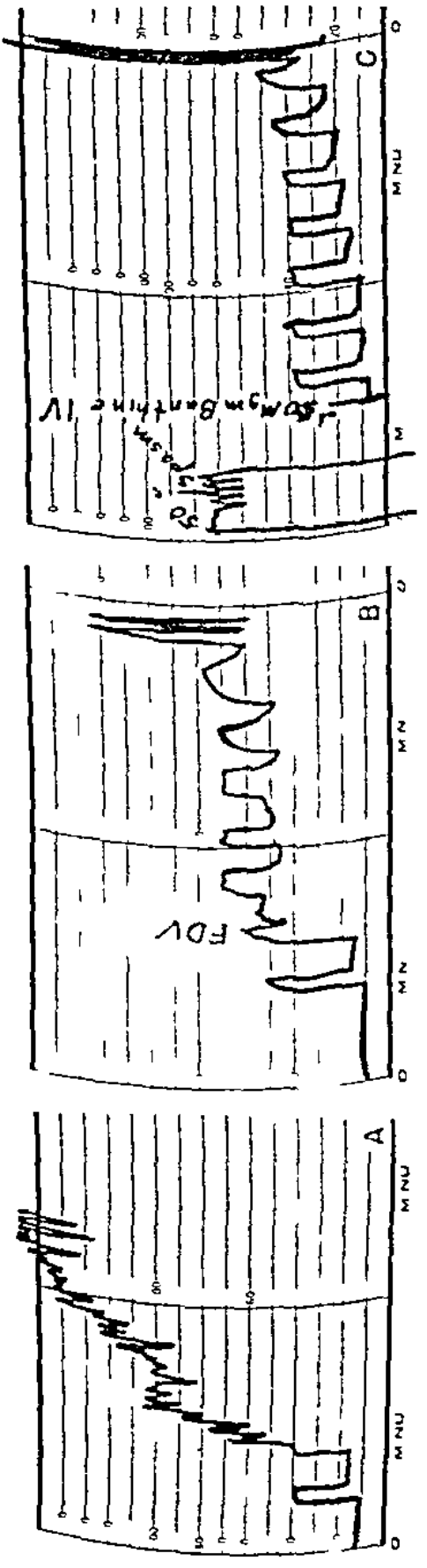
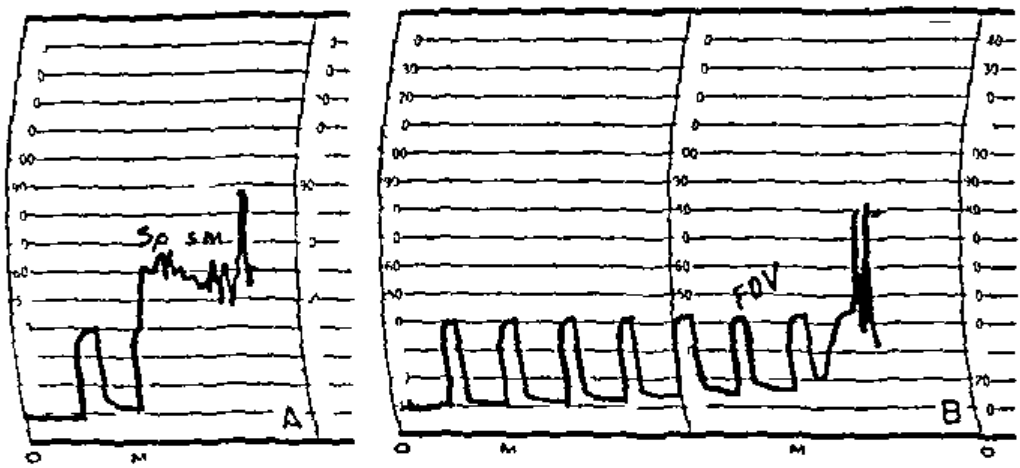


Figure 1 Cystomet ogram for case 1 (A) I rior to medication bladder capacity 100 cc (B) After 100 mg of banthine bladder capacity 350 cc (C) Banthine discontin ed three days bladder capacity 350 cc (FDV fi st desire to void.)

stant bladder spasms caused extreme discomfort and it was again necessary to have a urinal handy at all times He beg ed to have the banthine restored and this was done A cystometrogram was begun and after the bladder showed initial spasm with the first increment of filling the machine was stopped and 50 mg of banthine were administered intravenously and the cystometrogram continued Within 10 minutes after the intravenous administration of the drug the bladder again presented a nearly normal curve (fig 1C) Two months later this patient was doing well on 100 mg of the drug by mouth four times daily and was urinating voluntarily every three or four hours His social activity is limited only by the capacity of his bladder which has now reached 350 cc



gur 2 Cy t met gr m for cas 2 (A) P or t m a t on bladde pa ty 100 (B) After 100 mg f b th ne bl dd ap ty 400

Case ⁰ A 19 year old man was admitted to the urology service x treatment of bladder complications accompanying an obscure /pe of paralysis tentatively diagnosed as multiple sclerosis n uninhibited neurogenic type of cystometrogram was obtained ig 2A) and the patient was given 100 mg of banthine intra enously An oral dose of 75 mg every six hours was established ecause of moderately severe ide effects on larger doses After ur days of this regimen he was still urinating every 25 or 30 inutes but without incontinence and with sufficient warning) have a urinal in place A large bladder calculus was known) be present and the failure of banthine to increase his bladder capacity was attributed to the irritation of this calculus The calculus was removed with the Lowsley lithotrite and the regimen of 75 mg of banthine orally every six hours was resumed A normal cystometrogram was obtained at which time his bladder capacity was 400 cc (fig 2B) and he was voiding at intervals of from 45 to 60 minutes

Case 3 An 18 year-old man was admitted because of enuresis He gave a history of intermittent enuresis throughout his entire life, averaging once or twice a week In January 1952 at an Army hospital in Japan a diverticulectomy of the bladder was performed but without improvement At that time he was said to have a left ureterocele with hydroureter and pyelonephritis A roentgenogram of the lumbodorsal spine revealed a transitional type vertebra in the lumbosacral area with a defect in the neural arch resulting in a first degree spondylolisthesis Retrograde and intravenous pyelograms revealed a dilatation of the terminal portion of the left ureter and an apparently normal bladder shadow Cystoscopy and cystourethrograms were normal After three episodes of enuresis a cystometrogram was performed which revealed numerous uninhibited contractions (fig 3A) The patient was given 75 mg of banthine orally every six hours after the

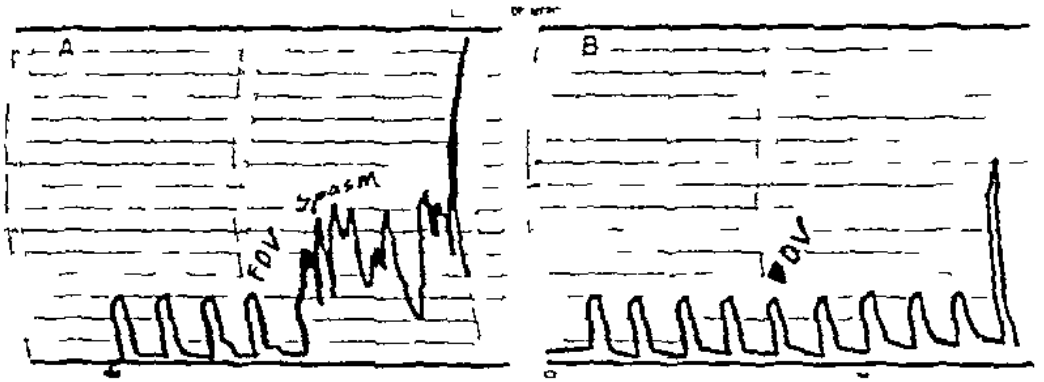


Figure 3 Cystometrogram for case 3 (A) Prior to medication bladder capacity 250 cc (B) After 75 mg of banthine bladder capacity 450 cc

same dose intravenously resulted in a normal cystometrogram Subsequent cystometrograms showed a normal bladder and the patient had only one episode of enuresis after drug therapy was started (fig 3B) Further observation of this patient was impossible because of a change of his duty station

Case 4 A 24 year old paraplegic was referred to the urology service for evaluation and treatment of a spastic type of neurogenic bladder A cystometrogram showed a severely spastic bladder of small capacity This patient had an asymptomatic calculus in the left kidney and numerous small bladder calculi, which were removed by litholapaxy Postoperatively, his cystometrogram revealed an uninhibited neurogenic bladder (fig 4A) He was given 100 mg of banthine every six hours orally following a diagnostic intravenous dose, which resulted in a normal curve 10 minutes later (fig 4B) When transferred from this hospital to a Veterans Administration facility he had good control and sufficient warning to have a urinal in place for micturition at intervals of from 30 to 45 minutes It is possible that this interval may gradually increase as it did in case 1

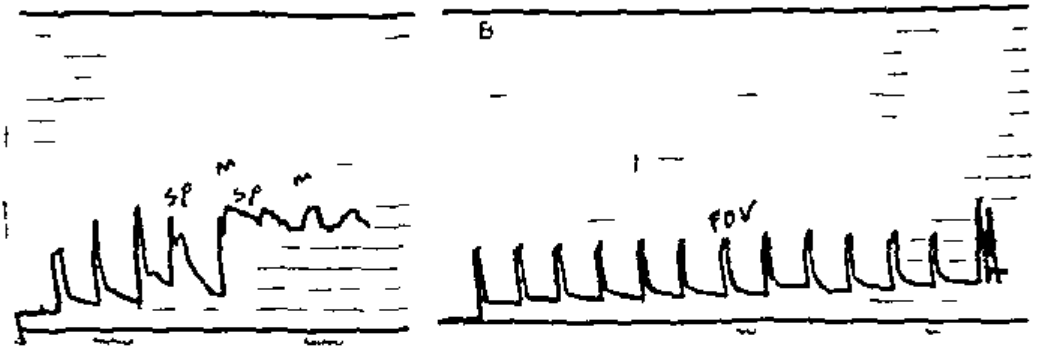


Figure 4 Cystometrogram for case of 75 cc (B) After 100 mg of bethanechol chloride (A) Preoperative medical condition bladder capacity 300 cc

Case 5 A 19-year-old man was transferred to the urology service because of urinary incontinence three or four times weekly and enuresis dating back to an injury incurred in Korea At the time of injury and subsequently there was no evidence of spinal or other injuries to his nervous system His neurologic findings were normal Cystometrograms revealed a spastic type of neurogenic bladder (fig 5A) Cystoscopy and cystourethrogram showed moderate trabeculation consistent with an uninhibited neurogenic or reflex type of bladder No cause was found for this defect The patient was given 75 mg of banthine by mouth every six hours following an intravenous dose of 100 mg which resulted in a nearly normal cystometrogram (fig 5B) He had no further incontinence or enuresis during the period of observation and side effects were minimal

DISCUSSION

It has been known for some time that quaternary ammonium salts were capable of causing paralysis of the bladder by impairing transmission of nerve impulses through the autonomic ganglia Tetraethylammonium chloride has never been used successfully in treatment of bladder disorders because of its severe side effects We did not observe complete retention of urine

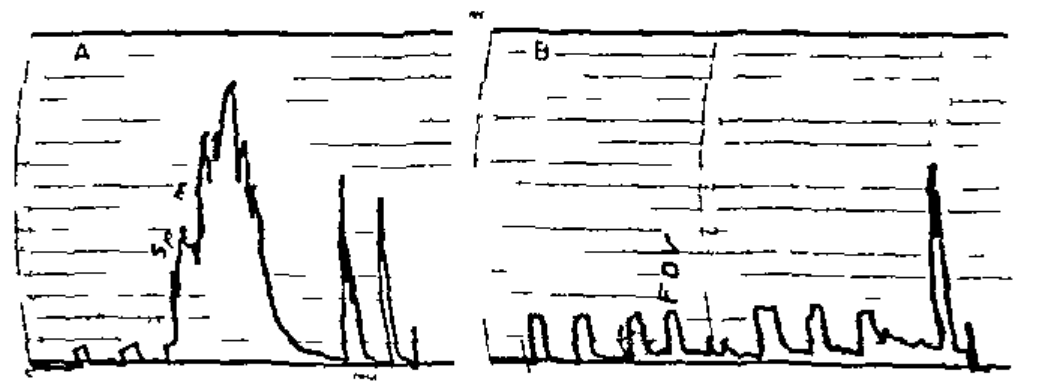


Figure 5 Cystometrogram for 150 cc (B) After 100 mg of bethanechol chloride (A) Preoperative medical condition bladder capacity 350 cc

although on one occasion a patient (case 2) did not urinate for six hours When preparations were being made to catheterize him, however, he voided spontaneously and thereafter did well The side effects of banthine in our patients were transitory and of only moderate severity and were manifested mainly by dry mouth and blurred vision One of us (R M F), in a personal therapeutic test of the drug for observation purposes, noted that the most distressing side effect was dryness of the mouth which made it difficult to swallow food The impairment of vision was a moderate photophobia rather than actual blurring Although the drug in therapeutic doses is said to have no effect on the normal bladder, it was thought that slight diuresis was obtained, probably due to decreased sweating There was also a moderate decrease in the force of the urinary stream, accompanied by a feeling of incomplete emptying of the bladder but this disappeared in two days Elderly patients may complain of sexual impotence

Originally the action of banthine on the bladder was regarded as an undesirable side effect of the treatment of peptic ulcer [2] In the presence of urethral obstruction, as in patients with benign prostatic hypertrophy, in whom the bladder is already exerting a maximal effort to empty itself, complete urinary retention may be expected as the bladder musculature is inhibited by the anticholinergic effects of banthine Lapides[5] and Riskind and Zide[6] have observed the effects of banthine on normal and neurogenic bladders Riskind and Zide reported excellent results in Hunner s ulcer and in chronic trigonitis

SUMMARY

Banthine has a depressing effect on the spastic bladder due to its anticholinergic activity and may be helpful in the treatment of all types of spastic neurogenic bladders Good results were obtained in five patients including one with congenital enuresis and four with uninhibited neurogenic bladders Several patients with reflex bladders (not recorded here) have been observed by us with disappointing results Banthine may be expected to increase the capacity of the reflex type of bladder, making the patient more comfortable and aiding in his rehabilitation by reducing the frequency of micturition The intravenous route is recommended for the first dose not only to provide a rapid evaluation of the effect of the drug but also to establish quickly an effective blood level which then can be maintained by oral administration Banthine should be injected slowly while observing the patient s pulse and blood pressure because marked elevation of both occurs during intravenous injection The antidote is neostigmine bromide

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Therapeutic Abortion

The two great purpo es of the rt of medicine are to save life and to rel v suffering Any situat on wherein a physici n not only witnesses de th but is called upon to cause it must be doubly distasteful to h m A therapeutic bortion i such a situation It is really an admiss on of failur on ll p rts to contr l disease nd remove its threat to the life of the mother Thus did Bowles and Domzalski i 1949 summarize one of the most imp tant nd controversial probl ms in modern m d ci — mpo t nt bec use ther peut c bortion is identified w th a plan how ver well i tentioned which culminate in th deliberate destruct on of the f tus prior to th p iod of vi bility controver ial becau e n this o phase of med c the l f of the baby s uncondit on lly sur r ndered to the di e se of the m ther

Th phys cian fro e rl est t mes ha dedicated his l f to the sav ng of human life I eaders in our pr fes ion from the d ys of *Hippocrates have emphas zed this co cept and have part cularly* tre d the respon ib lity of the phys cia n safeguardi g the life of *the urborn ch ld A recently s 1948 one of the most import rt pre* cept pr pounded by the World Health Organization in its Decl t tion *of Gene a is the st tement* I will *maintain* the utmost re pect for huma life from the t me of concepti n e en under threat I will not u e my medical knowledge co trary to th laws of humanity

—ROY J HEFFERNAN M D and
WILLIAM A LYNCH M D
in *American Journal of Obsterics and Gynecol gy*

PHYSIOLOGIC EFFECTS OF CERTAIN EXPLOSIVES AND CHLORINATED HYDROCARBON SOLVENTS

JOHN H FOULGER M D

TO PLAN a comprehensive program of health conservation for workers exposed to chemicals, one must answer four questions (1) How can chemicals enter the body to afford a health hazard? (2) What is the nature of the injury they might produce? (3) What practical protective measures can be employed? (4) How can one assess the efficiency of these measures?

WAYS IN WHICH CHEMICALS ENTER THE BODY

During industrial use, chemicals can enter the body through the skin as liquids or solutions, or sometimes as particulate matter, and through the respiratory tract as dust, mists, fumes, vapors or gases

We usually consider the skin as good protection, but it is not as good as we have imagined It has been shown in recent years that even a slight abrasion of the skin can open small blood vessels and lymphatics to the entry of solutions and of fine particulate matter Once having entered, chemicals can pass directly into the venous supply and be distributed throughout the body Normally we consider a man's skin as protected by his clothing and are apt to be concerned only with the contact of the head, neck, hands, or exposed forearms with hazardous chemicals, but we must not forget that contaminated clothing is a potential source of contact and a reservoir from which materials can enter the body Very few articles of clothing ordinarily worn are completely impervious to either solid or liquid chemicals, and almost none to gases

Even though a particular material may not pass through the skin, contact dermatitis or allergic dermatitis may develop While, in general, the hazard of injury by chemicals entering through the skin is not as great as when the chemical enters

Presented at the Fifth Annual Navy Industrial Health Conference Los Angeles Calif 19 April 1953 Dr Foulger is Director of Medical Research E I du Pont de Nemours & Co Inc Wilmington Del

the respiratory tract it may be greater than by ingesting the chemical In a recent survey of comparative toxicities by skin absorption and by ingestion I found that at least 50 percent of the materials considered were more hazardous by absorption In a few cases entry through the skin can be as rapidly injurious and even as rapidly fatal as entry through the respiratory tract. Thus a small quantity of ethylene chlorohydrin spilled on the shoes can penetrate the leather and skin and cause death Aniline or nitrobenzene spilled on the clothes can lead to severe cyanosis by production of methemoglobin One can never disregard the skin as a source of entry or clothing as a possible factor in hazards from chemicals

Only about 2 square meters of skin surface is exposed to the entry of foreign material however while in the lungs an area of about 100 square meters of capillary bed, through which chemicals can enter the blood stream is exposed at each inspiration Inhalation of chemicals in gases vapors mists fumes or dusts may not necessarily lead to prompt entry into the circulation The immediate effects of inhaling foreign material depend to a great extent on the irritancy of the material Nonirritant material may pass directly to the alveoli Particulate matter more than 10 microns in diameter, will probably be filtered by the cilia of the respiratory tract and eventually coughed up but smaller particles will pass to the alveoli be taken up by phagocytes and moved to the regional lymph nodes Dissolved material gases and vapors may pass directly through the walls of the alveoli into the capillary bed of the lungs and so into the systemic circulation This ease of passage may be modified however if the material inhaled has specific pharmacologic properties Contact with the walls of the respiratory tract may cause reflex activity which will modify the whole respiratory pattern

Irritant materials entering the respiratory system may have actions different from those due to absorption into the body For instance irritant particulate matter and irritant vapors striking the nasal mucous membrane can lead to an intense bronchoconstriction As a result inspiration is not impeded but exhalation is made difficult This is similar to the physiologic situation in bronchial asthma If such materials irritate the upper respiratory tract above and around the vocal cords they can cause acute spasm of the vocal cords or false vocal cords producing various degrees of laryngospasm and hindering respiration In an extreme case there may be complete closure of the airway This hazard of acute laryngospasm is well known to the anesthesiologist Irritant materials can lead to reflexes over the recurrent laryngeal nerve which may produce complete cardiac standstill If the cardiac muscle itself is hypoxic this

reflex action plus the condition of the muscle can result in ventricular fibrillation The possibilities of various degrees of laryngospasm, or of reflex action upon the heart, must not be overlooked whenever a chemical is inhaled, regardless of the fact that it may be of low toxicity

TYPE OF INJURY

We are concerned today with a number of explosives and with a select group of chlorinated hydrocarbons which might be handled in naval establishments or on board ship The detailed toxicology of these compounds would be voluminous, but the answer to our second question, "Against what type of injury are we to protect our workers?" is as follows

Ammonium picrate, while it stains the skin, does not lead to dermatitis, so far as I have observed, and, if it is absorbed into the body, does not lead to systemic poisoning

Nitroglycerin has no direct action on the skin, but it is very rapidly absorbed into the body and acts upon the smooth muscles of the smaller arterioles, causing a fall in arterial blood pressure It may lead to a circulatory collapse similar to that in orthostatic hypotension The action of nitroglycerin passes off fairly rapidly once exposure is ended and no harm should result unless the circulatory collapse is so severe as to lead to a pooling of blood in the extremities and abdomen with failure of return of blood to the brain In this case, syncope may occur, the outcome of which depends on the position of the patient If he should fall so that his body lies horizontally, return of the blood to the brain will be facilitated and he will recover quickly If he should fall in a "jackknife" position, however, with head up so that cerebral circulation cannot be restored rapidly, there could be a fatal outcome Nitroglycerin dilates cerebral blood vessels and the increased pressure within the skull produces severe headache

Tetryl is a major cause of allergic dermatitis in plants handling explosives Its activity is so great that contaminated clothing worn by a worker in a public conveyance may produce tetryl dermatitis in other persons traveling in the same conveyance Tetryl dermatitis does not affect all people, but it can be very severe and lead to great loss of time It is now definitely confirmed that tetryl, if absorbed into the body under conditions of industrial use, does not produce systemic poisoning

Trinitrotoluene (TNT) is one of the most hazardous of the ordinary explosives to handle It can be inhaled as fumes from melt pots during shell loading, or as dust during the removal of TNT from packages It can be absorbed through the skin by contact with contaminated equipment In the past, skin absorp

tion in unnecessarily dirty operations during shell loading has been the chief source of absorption of TNT The older method of filling shells by hand is being replaced by mechanical devices and cleanliness in the operation is improving TNT may cause a number of unfortunate conditions First it can produce a mild dermatitis but this has not been very important in industry Second the entry of even a few crystals of TNT into the mouth may (because of its bitter and unpleasant taste) lead to nausea or vomiting and gastrointestinal disturbance Absorption of TNT into the body causes gastritis with gastrointestinal disturbances of all types loss of appetite a peculiar pallor of the skin and a feeling of excessive fatigue and great anxiety This form of gastritis in some way involves nutrition because its incidence can be reduced if workers exposed to TNT receive adequate food intake Gastritis from TNT has caused a great loss of working time but it apparently does not lead to injury of the liver The most outstanding form of injury from TNT has been hepatitis Usually this occurs in a certain small proportion of the workers during the first 3 to 5 months of exposure Pathologically the findings are a central lobular necrosis, particularly in the left lobe and the inferior marginal region of the right lobe i e in those parts of the liver having the poorest circulation Nutrition is in some way involved in this activity of TNT A high fat diet apparently makes one more prone to the disease while a high protein diet has been claimed to be protective Even small quantities of TNT absorbed through the skin by susceptible individuals can lead to severe disturbance of the bone marrow and to death from neutropenia Handling of contaminated TNT boxes in shipment or moving them through a plant has led to this condition In workers exposed to TNT therefore one should take careful cognizance of the blood picture before employment and during exposure

Most explosives are nitrogen compounds In the process of nitration of organic material nitrogen oxides are produced Sometimes they appear as brown fumes but often the gases although in high concentration are almost colorless or only pale straw colored The intensity of possible exposure therefore and the effects which it might produce are not indicated by the color intensity of the gases These nitrogen oxides are not highly irritant and workers inhaling them may not cough or feel any particular uneasiness at the time but several hours later may develop a feeling of extreme fatigue Shortly after there may be respiratory uneasiness together with a fall in blood pressure and hemoconcentration Pulmonary edema may develop rapidly This may either be fatal, or be followed by secondary infection of the lungs unless adequate treatment is given promptly It is extremely important that workers who inhale nitrogen oxides be removed at once from exposure given bed

rest and inhalation of oxygen, preferably with exhalation against a pressure of about 4 cm of water If, with this treatment, the natural pink color of the face is maintained, the majority of patients will recover without severe pulmonary edema or, if edema develops, without important sequelas

The principal chlorinated hydrocarbons to be considered are tetrachloroethane, carbon tetrachloride, trichloroethylene, and perchloroethylene, which are all used in degreasing

Tetrachloroethane is a dangerous chemical Its use as a solvent for airplane "dopes" caused much illness and many deaths due to hepatitis in World War I This led to the disclosure of a similar action of TNT The allowable safe concentration of tetrachloroethane vapor in the atmosphere is only 10 parts per million by volume It should only be used in well engineered and rigidly controlled, closed equipment, never in open equipment or in any manner that allows skin contact or inhalation of vapors Its use was banned for many years in Germany

Carbon tetrachloride can probably be absorbed through the skin It is volatile and when inhaled passes rapidly into the blood stream Frequent exposure to concentrations as low as 45 parts per million can interfere with liver function It has been shown in a number of experiments on laboratory animals that inhalation of carbon tetrachloride vapors lead rapidly to constriction of the sinusoids of the liver In acute exposures, carbon tetrachloride is narcotic This may be its only immediate effect, but not infrequently there may be delayed action on the kidneys, leading to complete anuria and severe damage to the tubules Less frequently there may be a delayed hepatitis which, like hepatitis from TNT, appears to involve lack of oxygen supply to the liver and a central lobular necrosis Either the damage to the kidneys or to the liver may cause death

Trichloroethylene and perchloroethylene are essentially narcotic Trichloroethylene may offer a particular hazard to some people if they find the effects pleasant. It will produce a condition similar to "ether jags," with a feeling of exhilaration and intoxication much like the more pleasant phases of alcoholic intoxication For this reason some workers will deliberately expose themselves to heavy concentrations of vapor, often with serious and even fatal results Fat solvents of this type, if entrapped between clothing and skin, either as liquid or vapor, can produce severe burns One interesting case came to my attention A convict in a western penitentiary, working with a degreaser, became an addict to trichloroethylene One day he took a bottle of the solvent to his cell, got into bed, and covered himself with a blanket, apparently inhaling the trichloroethylene under the blanket. He either spilled the trichloroethylene or a

high concentration of vapors was produced under the blanket causing a severe dermatitis Photographs showed a widely distributed erythema which made him look almost like a boiled lobster

When inhaled in high concentrations trichloroethylene may interfere with the uptake of oxygen by the tissues The venous blood oxygen content approaches that of the arterial blood When fatalities occur as a result of excessive narcosis by trichloroethylene the appearance of the blood is similar to that in carbon monoxide or cyanide poisoning A number of fatalities from trichloroethylene have occurred after unnecessary exposure not because of some particular toxic action but because of circulatory failure Although it has no immediate, apparent effect continuous exposure to trichloroethylene possibly at concentrations of from 300 to 400 parts per million seems to make a worker more sensitive to an acute exposure Inhalation of high concentrations of the vapors may lead only to dizziness but if during the period of dizziness the worker undergoes excessive physical exertion there may be acute circulatory collapse A number of patients of this type were observed in England several years ago and two workers collapsed while bicycling home after an unnecessarily high exposure to trichloroethylene Deaths of the beepan type have also occurred following excessive exposure Such exposures however need never occur and will not occur if one pays particular attention to proper engineering of degreasing equipment and eliminates those workers who appear to be addicts

The literature contains various references to older cases of alleged trichloroethylene poisoning in which widespread and bizarre symptoms and signs were reported but there seems to be no clean cut proof that trichloroethylene alone injures either the kidneys or the liver If trichloroethylene is swallowed (which has occurred when as a joke it has been put in a soft-drink bottle) there is a period of narcosis and complete anuria When the narcosis disappears the kidney function reappears and so far as I know there have been no permanent effects

No severe injuries have occurred in the use of perchloroethylene Its effect as a narcotic is not as pleasant as that of trichloroethylene and it apparently does not produce addiction There is no proof that injury of liver or kidneys has been produced by perchloroethylene

PROTECTIVE MEASURES

The third question is How can we protect our workers against these chemicals? Because the two common routes of passage of chemicals into the body are through the skin and through

the respiratory tract, it is obvious that cleanliness of equipment, surroundings, and clothing, and personal cleanliness of workers are essential to reduce skin contact Soap and plenty of water are often better preventives than so-called "protective clothing" If one is not careful, contaminated clothing can act not only as a reservoir for absorption through the skin but, in the case of volatile chemicals, as a source for inhalation of relatively high concentrations of vapors Provision of adequate changes of clothing (including underclothing and shoes), and of proper showers with suitable soap and enforcement of rules respecting showers so that no worker leaves the plant in contaminated clothing, are the major ways of solving the skin problem Protective creams can often be a hazard Unless it is proved that a particular cream specifically prevents absorption of a given chemical through the skin it should not be used

Cleanliness of the atmosphere in a working area is of great importance Reduction of dust and removal of hazardous vapors are problems for the engineer The physical properties of the compound involved determine the particular program of ventilation It should be a basic principle that dusts, vapors mists, fumes, and gases must be removed at their source It is not wise to attempt protection by mere dilution This may spread the area of possible exposure of workers far beyond the area of the immediately hazardous job

EFFECTIVENESS OF PROTECTIVE MEASURES

My fourth question, "How shall we assess the value of our protective measures?" leads us into the medical portion of this paper I have continually expressed the opinion that it does not matter what is in the atmosphere of the work plant—the atmosphere could actually be violet with yellow stripes—so long as no worker is affected by it One cannot demonstrate by chemical analysis of the atmosphere but only by examination of the worker, that a worker is or is not affected The major duty of a physician in industries using hazardous chemicals is to watch the worker continually This is best done by frequent visits to the working areas and by observing each worker at his job In this manner one can detect operation practices that may lead to unnecessary health hazard Observation of the worker in this way must be supplemented by some form of medical examination Yet, conditions in industry and the multitude of different compounds that may be involved restrict severely the type of examination which can be employed

For nearly 18 years I have observed a large number of workers exposed to a wide variety of chemicals and have supplemented these studies by many animal experiments As I stated many years ago regardless of the chemical nature of a hazardous

material, a definite pattern of symptoms and a few physiologic signs are always observed when that chemical enters the body in adequate amount to have any effect upon its function and before it has any permanent effect upon the structure of tissues The symptom pattern includes headache nausea and other gastrointestinal disturbances as belching constipation or diarrhea or both loss of appetite epigastric pain dizziness and in severe cases dyspnea on slight exertion palpitation precordial pain pain in the extremities and at the back of the neck These complaints of pain particularly in the extremities the back of the neck or over the precordium, should never be neglected

The signs which invariably occur are changes in pulse rate and in arterial blood pressure Acute exposures tend first to reduce systolic pressure without diminishing diastolic pressure Thus pulse pressure is reduced and the efficiency of blood supply to the muscles is diminished Later there may be a greater fall of systolic pressure and of diastolic pressure and eventually systolic pulse pressure and diastolic pressure may reach very low levels A condition similar to orthostatic hypo tension may then exist These acute episodes of circulatory imbalance rapidly disappear on removal from exposure and often even more rapidly on inhalation of 100 percent oxygen Chronic exposures to concentrations of chemicals not actually causing damage of an organ may lead to chronic diastolic hypertension

Over a number of years we have used various statistical methods of assessing trends in arterial blood pressure to indicate situations that are producing adverse trends in health of workers We have frequently used such statistical studies to demonstrate the relative hazard in group operations By this means we have sometimes discovered hazards of which we were formerly un aware For example in a TNT plant a summary of blood pres sure records taken every 3 weeks on occupation groups was used to assess the relative exposure in the various operations Our indexes of blood pressure abnormalities showed a trend of relative hazard in the operations which fitted the known physical conditions of the operation However one group not expected to be exposed to TNT or other toxic materials showed a blood pressure record far from normal It was found that their place of work was not ventilated and that the men were stencil ing TNT boxes with a spray of ink containing about 80 percent cresylic acid The literature contains only one reference to the effects of inhaled cresylic acid in which it is reported that the compound when inhaled affects the central nervous system and the heart muscle These effects are not so apparent when the chemical is absorbed through the skin or when swallowed

Adverse trends in blood pressure records sometimes indicate that workers have failed to take their daily baths at the end of the day, and have gone home with contaminated skin and clothing Their duration of exposure to toxic chemicals has increased and they soon have physiologic signs

The measurement of blood pressure is, of course, not the only method of following the health of workers Where chemicals may act upon the hematopoietic system, frequent evaluation of hemoglobin, red cells, leukocytes and, perhaps, platelets are important Urinalyses may be useful I have seldom used these and only to disclose unnecessary exposure to chemicals in different operations rather than for diagnostic purposes Unfortunately, adequate methods of detection of many of these toxic chemicals in the urine do not exist, and in large plants a program of frequent urinalysis may be complicated and difficult to set up The situation with respect to urine excretion of organic chemical compounds is not the same as that existing in the case of lead and inorganic chemical compounds

Whatever method is used to obtain quantitative data on the conditions of workers exposed to chemicals, it should lead to frequent observation of each worker by the plant physician who will be able to see when the workers are failing in health By frequent contact with the men, and particularly contact on the job, he will gain their confidence This will have two results Not only will the morale of the individual worker be raised, but he will tend to come to the physician and to tell him of factors in both his industrial life and in his home life which may be of the utmost importance in controlling the health in the plant In these days of a 40-hour workweek, only the smaller fraction of a worker s life is spent in the plant That part spent out of the plant is at least as important in conditioning the worker s total health and his ability to resist hazards from chemicals as is that part spent in the plant Any procedure that will help the physician to gather information about the total life of the worker is essential to a satisfactory program of conservation of health In industry we are studying the whole man Data from clinical study of sick people are not necessarily directly applicable to the healthy worker Treatment of infections has so advanced in recent years that diseases of stress are assuming greater importance than diseases caused by bacteria or poisoning Such diseases are due to our attempt to live with our environment, often with an environment which we ourselves manufacture In the study of the basic factors entering into degenerative diseases, industrial medicine conducted in the manner I have suggested is at the forefront of medical research

INCIDENCE OF RUBELLA AT AN ARMY POST

HERSCHEL SANDBERG *F t L t na t MC USAR*

INGALLS H SIMMO IS *L tena t Colo I MC USA*

RUBELLA or German measles is an acute infectious eruptive disease characterized by a long incubation period a short invasive stage a benign course and an almost complete freedom from complications Due to the lack of specific control measures and its benign course little attention has been paid to its occurrence in military camps and posts Since 1945 various investigations have demonstrated a link between the incidence of German measles in women during the first trimester of pregnancy and the appearance of congenital anomalies in their infants born subsequently During severe epidemics meningoencephalitis endocarditis and ne phritis have been reported as sequelas of this disease Because of these observations a study was made of the incidence of this disease in military personnel at Fort Dix N J during 1948 1952 to evaluate the man days lost attributable to it.

METHOD OF STUDY

This post had an average assigned military population of 23 000 troops during the study of which about 10 000 were seasoned cadre and 13 000 were new recruits sent to the post for basic training This post is situated near several large cities (Trenton Philadelphia and New York) where soldiers often visit when on leave Recruits arrive from all sections of the country and there is no segregation by race or geographic area

The recruit training is organized in 8 and 16 week cycles 80 percent of it being 16 weeks The sixth thirteenth and fourteenth weeks of training are spent on bivouac A few days after arriving on the post each recruit is assigned to a training company When the full complement of recruits is present the company begins its training cycle After completion of training the men are transferred from the post and the company receives a new complement of recruits for the next training cycle For the first 4 weeks the recruits are restricted to the post They

F m U S Army H p I F D N J C I S mm w Headq F (th Army Ch g III

are housed in 63 man barracks and each building is occupied by men of the same unit There are company messes serving a single company, and consolidated messes serving several There is intermingling of men from different companies, and of recruits with seasoned men, at post exchanges, service clubs, theaters, and on buses

The study was limited to assigned military personnel who were hospitalized on the post for suspected rubella Each patient was first examined by a dispensary physician, again by the physician in charge of the outpatient clinic of the hospital and, finally, by the medical officer in charge of the contagious disease ward The latter was usually a physician who had completed one or more years of a residency in pediatrics, or two or more years in internal medicine The final diagnosis of the medical officer in charge of the contagious disease ward was used in this study Of the admissions in the first half of 1952, a record was made of the age, race, length of hospitalization of each patient, and whether he was a recruit or in a cadre If he was a recruit, a record was also made of the duration of his training By these methods an attempt was made to compare the incidence of rubella with that of common respiratory diseases reported by Sartwell [1]

RESULTS

A comparative study of the incidence of rubella by calendar months from 1948 to 1952 indicates that from November 1948 through October 1950, German measles was not a major problem The incidence rate of rubella never rose above 19 per thousand per annum and only once reached that level (January 1950) In the period from November 1950 through June 1952, the incidence was higher A peak of 123 per thousand per annum was recorded for April 1951, and 77 per thousand per annum was reached in March 1952

From 1 January to 31 December 1951, 628 patients were hospitalized for rubella The rate began to climb rapidly in the third week of March, reached its peak in the third week in April, and declined sharply the second week of May It reached a secondary peak during the third and fourth weeks of May and then rapidly declined Relatively high rates were recorded for the months of June and July

The disease appeared much earlier in 1952 Higher rates occurred in January, February, and the first week in March than were reached in 1951 The peak for the year occurred during the second and third weeks of March, and then declined rapidly A secondary peak occurred during the final week in March and the first week in April, but dropped sharply during the second

week of April It never again reached these high levels during the period covered by this study

TABLE 1 *I c d dm r t s for rub ll J uary J* 1952

M th	Wh t ec uit	Wh t c d	N gr d cru t	Neg o d cadr
J ry	23 8	17 1	24 3	00 0
Febru ry	48 1	30 0	00 0	00 0
M h	101 9	51 6	17 4	39 6
Ap l	73 6	16 5	39 7	29 3
M y	19 1	10 7	21 7	00 0
Ju	7 1	2 8	00 0	00 0
M t	45 6	21 5	17 2	11 5
M n tr g h	11 405	8 719	1 370	1 220

P 1 000 p um f f d m h

In table 1 the incidence rates of rubella during the first 6 calendar months of 1952 are presented in relationship to race and status These data show that the incidence of this disease was significantly higher in Caucasian than in Negroid troops but was lower in seasoned personnel than it was in recruits The racial factor may be partially explained by the difficulty in diagnosing this disease in Negroid troops Because the symptoms were mild most patients did not report on sick call until a rash was noted In Negroes this eruption is more difficult to detect The higher rate in recruits as contrasted to cadre members compares favorably with the data accumulated by Sartwell for common respiratory diseases as well as with the studies of the Commission on Acute Respiratory Diseases at Fort Bragg during World War II

Table ? hows the incidence of the disease in recruits according to the training week of occurrence A study of all personnel on the post revealed that the total number of training companies in bivouac remained relatively constant during the period 21 January to 25 May 1952 The number of companies in the specified week of training also remained essentially the same during this interval The highest incidence for rubella occurred during the fourth and fifth weeks and declined sharply in the sixth week The reasons for the low rates in the later weeks of the training cycle are not known The high rates in the fourth and fifth weeks are similar to data accumulated for common respiratory diseases by Sartwell but the relatively high rate

in the seventh week of training at this post and not occur in his data

TABLE 2 *Number of cases of German measles in recruits by week of training January June 1952*

Week of training cycle	White	Negroid
0 Filling	13	1
1	9	0
2	16	1
3	19	0
4	38	3
5	33	2
6	19	1
7	27	1
8	14	1
9	8	0
10	12	0
11	9	1
12	6	0
13	10	0
14	6	0
15	8	1
16	6	0
0 Shipping	15	0

From 1 January to 7 July 1952, a total of 388 persons was hospitalized for rubella The ages of recruits admitted to the hospital during this period ranged from 17 to 21 years with a mean of 20 2, the ages of cadre members admitted during the same period were from 18 to 34 years, with a mean of 21 9 The average length of hospitalization for recruits was 6 9 days, and for cadre members was 5 8 days The end result was a loss of approximately 2,400 man days of training time

SUMMARY

During a 3½ year period the incidence of rubella at an Army post was significantly higher in recruits than in seasoned personnel During 1952 it was higher in Caucasian than in Negroid troops The highest incidence in recruits occurred during the fourth and fifth weeks of basic training in 1952 Rubella is of considerable military importance in terms of man days lost from

training despite its mild course and relative lack of complications

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Radiation of the Liver

The fi st palliativ treatment fo ad an d l ver canc r which had alway b en reg rded a hopeless w s report d recently to the Amer c n R dium Society in St Louis It was st t d that large amounts of x-r y delivered directly to the liver improv d it funct on and n 28 out of 36 c ses temporarily r lieved such ymptoms of cancer s p in bdominal disten ion nau e we k ess and fever a d loss of ppetite According to the report cancers which had spre d to the l v w e on id r d hopele bec use t was gen rally tho ght that n mal l v r t ssue s a en t ve to x ays as cance tissue and that l v function w uld be de troy d by radi tion

The pat ents we e tre ted w th l rge quantitie of x-r ys varying from 2 000 to 2 750 roentg n Us ng 1 000 000 volt radiat o equip ment equal qua t t f x-rays were del vered to th nt liv r by r d ting the patient both teriorly and p t i rly Th v st ga t r found n id nc of damage to the normal l ver ti ue t even the h gh st d s l el f -rays Improvement la ted f om two to seven months Th ppear to ind cate that p t nts w th dv nced wid pre d h h has nvolved the li er may now be rega ded as am nable l t v t eatment

—from *Canc Cont ol Letter*

THE EFFECT OF ORAL ESTROGENS ON SERUM CHOLESTEROL AND TOTAL LIPIDS

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JOSEPH R VIVAS *Lieutenant Colonel MC USA*

IN 1936 Levy and Boas[1] in studying several thousand patients came to the conclusion that coronary artery disease was 4 9 times as frequent in men as in women of these women with coronary artery disease, 93 3 percent had arterial hyper tension or diabetes mellitus

In 1950, White et al [2] examined 600 hearts from men at autopsy for the amount of coronary sclerosis One hundred hearts were selected consecutively in each of the six decades from 30 through 80 They showed that the degree of coronary sclerosis was not linearly related to age in man It increases in the 30 through 49 year age group, reaching a maximum in the 50 through 59 year age group, and thereafter remains at a fairly constant level Ackerman et al [3] similarly examined 600 hearts from women In those the average degree of sclerosis did not rise until the fourth decade but rose steadily from this point to the eighth decade where it leveled off It is in the fourth decade that ovarian activity begins to wane in most women

Although Gofman et al [4] stated that there is little correlation between the total serum cholesterol levels and atherosclerosis, it would seem that a relationship does exist At least significant cholesterol elevation is often present in those with coronary artery disease Keys[5] reported a high degree of correlation between the concentration in human blood serum of total cholesterol and the "giant molecules (G substances) He stated that the time had not yet arrived to abandon the well established idea that there is an important relationship between the concentration of cholesterol in the blood plasma and the development of atherosclerosis and coronary heart disease After carefully comparing analyses from Gofman s group with the study of Gertler et al which dealt with the cholesterol levels in normal persons and

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patients with coronary disease Keys stated There is no evidence that the concentration of G is more critical than that of total cholesterol

Steiner after studying several hundred patients found that serum cholesterol levels were higher in patients with overt atherosclerosis than in normal persons Other investigators who have found an elevated serum cholesterol in patients with coronary artery disease include Priddle Davis et al Steiner and Domanski Lerman and White and Morrison et al

The lower incidence of atherosclerosis in women of the child-bearing age is well known During this period of greatest ovarian activity the average cholesterol values in women are less than those in men of comparable age At this hospital serum cholesterol determinations are not done routinely on the patients in women s general medical and officers wards but those done during 1950 and 1953 revealed the following average levels of total cholesterol in mg per 100 ml blood 38 premenopausal patients none with diabetes 176 these patients and 5 with diabetes 193 47 postmenopausal patients none with diabetes 259 and these patients and 9 with diabetes 265 In 55 male patients under the age of 50 261 44 over the age of 50 258 42 without diabetes atherosclerosis or reference to age 223 53 with arteriosclerosis 284 and 47 with no evidence of atherosclerosis 231

Men of all ages and postmenopausal women tend to have nearly the same cholesterol average levels which are higher than those of premenopausal women Wuest of the Mayo Clinic found that the degree of coronary atherosclerosis in bilaterally oophorectomized women was greater in each decade of life than in a control series Gyorgy and Rose have demonstrated that estrogens have a definite lipotrophic activity in inbred rats

The present study was conducted to note the effects if any of oral estrogens upon cholesterol and total lipid levels in men

METHOD OF STUDY

After determination of the pretreatment cholesterol and total lipid levels 18 persons were continued on their usual pretreatment diet and given 5 mg (1 25 mg four times a day) of oral estrogens (premarin) daily

Serum cholesterol was determined by the method of Bloor and the total lipid by the method of Kunkel et al Blood was drawn at the same time each week and all tests were performed immediately by the same technician

Seventeen men and one postmenopausal woman received the drug (table 1) Twelve of the men had had one or more proved myocardial infarctions two had mild hypertension one had arterio-

TABLE I Summary of significant findings in patients treated

Patient	Age	Height	Weight	Build	Blood pressure	History	Weeks of estrogen treatment	Side effects
1	51	74	190	Ectomorph	95/60	Acute anterior myocardial infarction 27 June 1952	6	None
2	61	66	145	Mesomorph	115/70	Acute anterior myocardial infarction June 1952	5	Breast soreness
3	37	72	190	Ectomorph	188/108	Transient hypertension for three years.	9	Breast soreness
4	56	72	166	Ectomorph	110/70	Acute posterior myocardial infarction 2 December 1953 Angina of effort	11	None angina related but returned
5	57	66	135	Mesomorph	155/80	Mild cerebrovascular accident August 1952	9	Withdrawal bleeding
6	48	70	172	Mesomorph	120/70	Acute anterior myocardial infarction 1945 Second infarction 10 September 1952	12	Breast soreness
7	33	70	180	Mesomorph	110/56	Subacute bacterial endocarditis Posterior myocardial infarction In hospital six months Died during estrogen treatment	3	None

The female patient

TABLE I *Summary of previously unreported cases of hypertension—Continued*

Patient	Age	Height	Weight	Build	Blood pressure	History	Weeks from Remission	Subsequent course
8	67	66	142	Endomorph	155/70	Referred from Army May 1945 for surgical consultation	14	Died 1 blid
9	63	66	175	Intermediate	160/90	Symptoms of [illegible]	11	Not followed
10	39	66	178	Endomorph	110/66	Admitted [illegible] 12 October 1952	25	No
11	42	71	185	Mesomorph	160/100	Mild hypertension [illegible] Referred from Army May 1947	2	Still
12	69	71	182	Mesomorph	130/88	Admitted [illegible] July 1952	12	Remained
13	60	68	168	Mesomorph	160/90	Admitted [illegible] with RBBB and [illegible] 1944	11	Remained
14	59	0	150	Mesomorph	250/150 130/75	Hypertension 1944 [illegible] 1949 Papilledema [illegible]	8	Remained
15	61	65	130	Mesomorph	112/72	Admitted [illegible] 17 September 1952		Remained

TABLE I Summary of sign ficant findi gs in patients studi d—Conti d

Patie t	Age	Height	We ght	Build	Bl od pre s re	Hi tory	W ks of e troge t atm nt	Side ffects
16	58	72	158	Fctom ph	110/66	Ant rior myoc rdial infarcti n 1946	9	Br ast oreness
17	58	66	176	Mesomo ph	130/80	A teri r myoc rdi l inf rct n 2 A g st 1952 Angina nce 1933	12	None ngin lie ed but re t rned
18	36	74	200	Mesom ph	110/76	Po teri myocardial i f r tion 24 April 1952	4	N ne

sclerotic heart disease without infarction one had been retired from the Army in 1945 for generalized arteriosclerosis and one had severe generalized pruritus of unknown cause The woman had had a mild cerebrovascular accident from which she had fully recovered except for periods of mild depression The ages of the men varied from 33 to 69 years the average being 52 the woman was 57 years old

RESULTS

The patients received the drug from 2 to 25 weeks each The drug was discontinued in nine patients because of side effects chiefly breast soreness Four patients moved from the immediate vicinity and a follow up could not be obtained Another died during treatment The remaining four were having no side effects when the drug was discontinued arbitrarily (table 2)

Reduction in the cholesterol and total lipid levels occurred in all but two of the patients One of these discontinued the drug after two weeks because of severe nausea and vomiting and it was doubtful if he retained any significant amount of the estrogen The other moved away after four weeks

In general but not always the total lipid levels paralleled the total cholesterol levels The time of maximum drop in cholesterol levels varied from 2 to 10 weeks averaging about 6 weeks The magnitude of the maximum drop varied from 50 mg to 298 mg per 100 ml averaging 90 mg (including the two failures) As the drug was continued the trend of the cholesterol values was toward the previous levels Cholesterol values returned to pretreatment levels in most instances after cessation of the drug

The nine men who developed breast soreness did so during the sixth to the eleventh week In general it was mild and not incapacitating Six men noted no side effects but one had severe nausea and the drug was discontinued at the end of two weeks One age 67 complained of loss of libido The woman patient experienced no side effects except when she stopped taking the drug during an attack of influenza This was followed by withdrawal bleeding that lasted for 10 days

The patient who died during the study was a 33 year old man who had severe coronary artery disease and had been hospitalized for six months Postmortem examination showed extensive myocardial damage due to old and recent myocardial infarctions Two men obtained relief from angina" early in the treatment but their symptoms gradually returned with continued estrogen administration

TABLE 2 *Total serum cholesterol and lipid mg /100 ml*

Patient	Pretreatment	Number of weeks of therapy																	Number of weeks after therapy					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	18	21	25	2	3	4	5	6	8
1	468 790				280 675		240 615																		
2	390 938	300 750	267 563			255 650														327 750					
3	380 705	83 687			260 650			208 625		210 620															
4	380 756		350 750	279 737			258 690		238 600			251 615													
5	300 731		180 765		234 739					275 758										314 9 8		340 *69*			3 (1103
6	295 804		240 740			227 694	220 6 (		320 725		193 627			195 *69*								8 7 6			
7	294 720	321 698		222 675																					

TABLE T t l *num b l terol and l d mg /100 ml —C* d

p	I or h py	N mb f w k f h py																		N mb f k f h py					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	18	21	25	2	3	4	5	6	8
8	284 700	222 824		280 780		216 771		179 690			192 848		240 850		272 640					285 1050		285 902		300 875	
9	280 715		274 757		31 798			*162* 738		38 706		2 0 646									275 970			288 775	
10	266 652	250 637	00 600				190 498			180 500		200 460		205 475		203 502	20 490	201 510	200 525						
11	267 817	260 850	360 781																						
12	254 715	196 606			265 839		232 710		260 808		280 806		272 529							280 808				2 8 758	
13	250 690		258 702	270 740		192 625		190 720		218 737		193 704											180 0		
14	250 648	225 580		196 57		200 595		215 600	260 C 0																
15	231 670	220 652		190 637		200 628		228 615		174 600													170 632		

TABLE 2 *Total mm cholesterol & lipids mg/100 ml —Continued*

Patient	Prior to therapy	Number of weeks of therapy																Number of weeks after cessation of therapy					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	18	21	25	2	3	4	5	6	8
16	270 710	230 668				190 605				170 725														250 675	
17	716 715	715 715	214 640		200 650			172 624		192 682		205 658		216 700						214 512		208 670			240 555
18	07 860		229 714		223 814																				

The chemical methods employed are similar
[illegible] values [illegible] abstracted

CONCLUSIONS

Oral estrogens will lower the cholesterol and blood lipid levels in men but the decrease is not generally maintained on continued treatment. The side effects though not usually severe may be objectionable

SUMMARY

Seventeen men and one woman were given 5 mg of oral estro en (premarin) daily in divided doses after meals and at bedtime for periods varying from 2 to 95 weeks A decrease in cholesterol and total lipid levels occurred in all but two men and the maximum decrease averaged 90 mg per 100 ml and occurred from the second to the tenth week With continued therapy or cessation of therapy the cholesterol and total lipid levels began to return to the pretreatment levels Side effects were not marked the most common being breast soreness which occurred after an avera e of about eight weeks of therapy Severe nausea occurred in one patient

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DIPHTHERIA OUTBREAK IN ALASKA

VERNE H ALDER *Major USAF (MC)*

DURING October 1952 more than 100 patients with diphtheria were diagnosed on the basis of clinical findings or laboratory examinations among residents of 11 villages on the southwestern mainland of Alaska There were 20 cases reported and 2 deaths occurred among the 188 people at Akiachak at that time In late November and early December at least 6 additional deaths, presumably due to primary diphtheria or its complications, occurred in the same Eskimo village This report presents the clinical, laboratory, and epidemiologic data with particular respect to the events at Akiachak

The area shown on the map (fig 1) is typical flat tundra country, with innumerable lakes and streams There are about 60 villages in the region, mostly along the Yukon and Kuskokwim Rivers, and the Bering Sea coast The few so-called "tundra villages" are actually on waterways with access to either the two main rivers or the sea

Bethel is the social and economic hub of the area Its population of about 500 Eskimos and 100 people of white blood was augmented by another 100 construction workers (almost all white) during the summer and early fall of 1952 None of the many villages along the two rivers or the coast has a population of more than 200 although their total population is about 6,000 Except for storekeepers, teachers, and their families, the inhabitants are Eskimos The high birth and death rates (both about 45 per 1,000 per year) result in population distributions different from those of the continental United States For example, the 1950 census showed that about 50 percent of the Eskimos in this area were under 20 years of age whereas in the United States less than 35 percent were in that age group

The economy of this area is dependent on the salmon that spawn in the Kuskokwim and lower Yukon Rivers and constitutes a large part of the diet, supplemented by other fish and game animals, for both the natives and their dogs The natives make a living from trapping and from employment in the Bristol Bay salmon canneries for five weeks during the summer Housing is primitive (fig 2) and the only well built structures encountered in Akiachak and elsewhere were the churches, trading posts, and schools The Alaska Native Service officer at Bethel main

From the 5005th U S Air Force Hospital Group

tained morning and evening radio contact with each of the vil lages which have a schoolteacher employed by tl e Service Mail planes from Bethel stopped at almost all of the villages at least twice a month, weatl er permitting

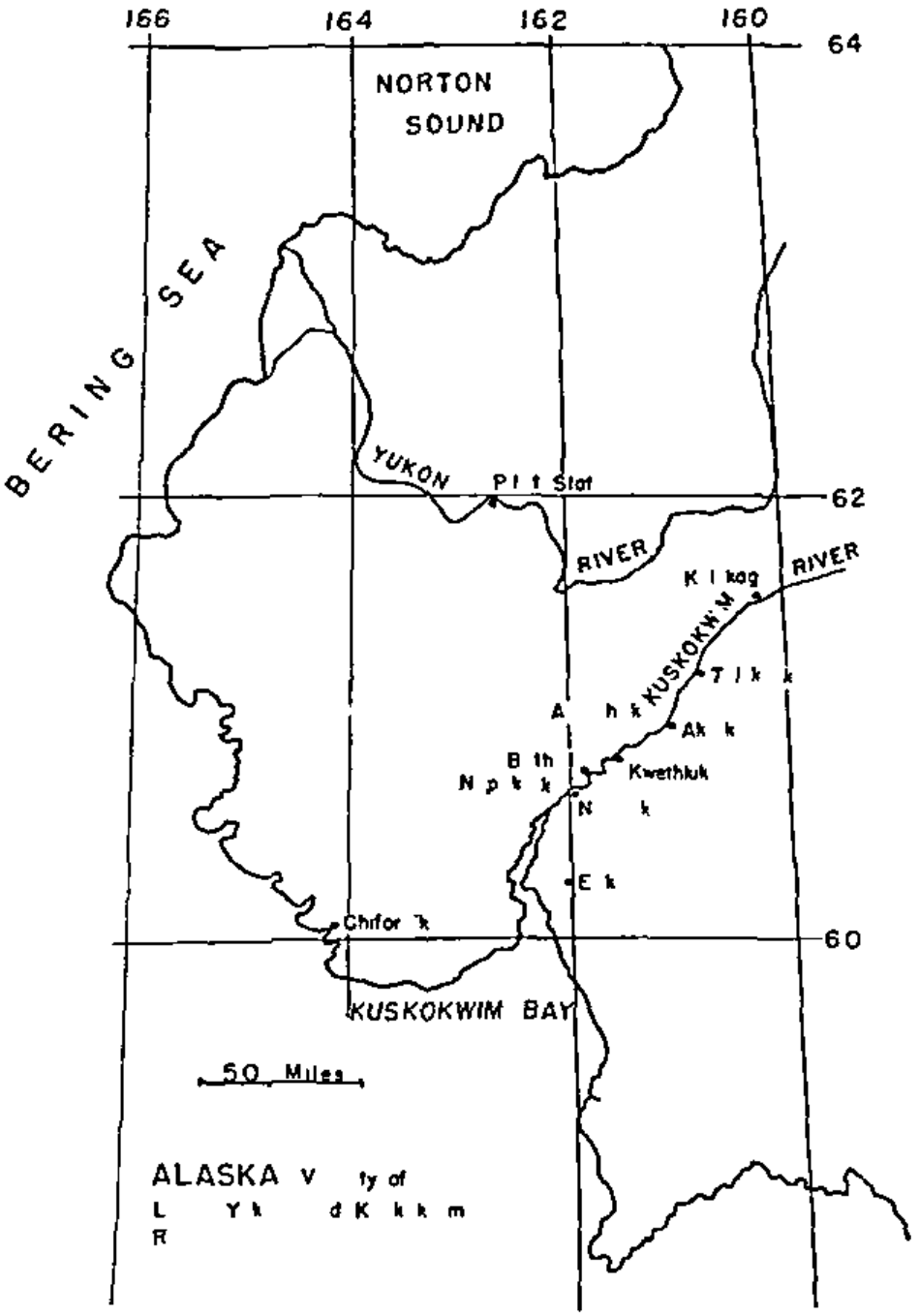


Figure 1 Map hows a a and v llages in wh ch d phth a tbr ak oc ur d.

The medical services available in the area were minimal Since a fire destroyed tl e small hospital at Bethel in 1950 the Alaska Native Service has maintained a six bed emergency unit there taffed by a pl ysician and six nurses The Alaska

Department of Health provided three public he[illegible] t Bethel These two groups constituted the he[illegible] f[illegible] e[illegible] ic an area greater in size than the state of Illinois [illegible] populated The U S Air Force through its [illegible] evacuated seriously ill or injured patients to [illegible] f[illegible] further care

On 6 and 7 October radio reports of three or fo deaths near Chifornik and one at Akiachak were

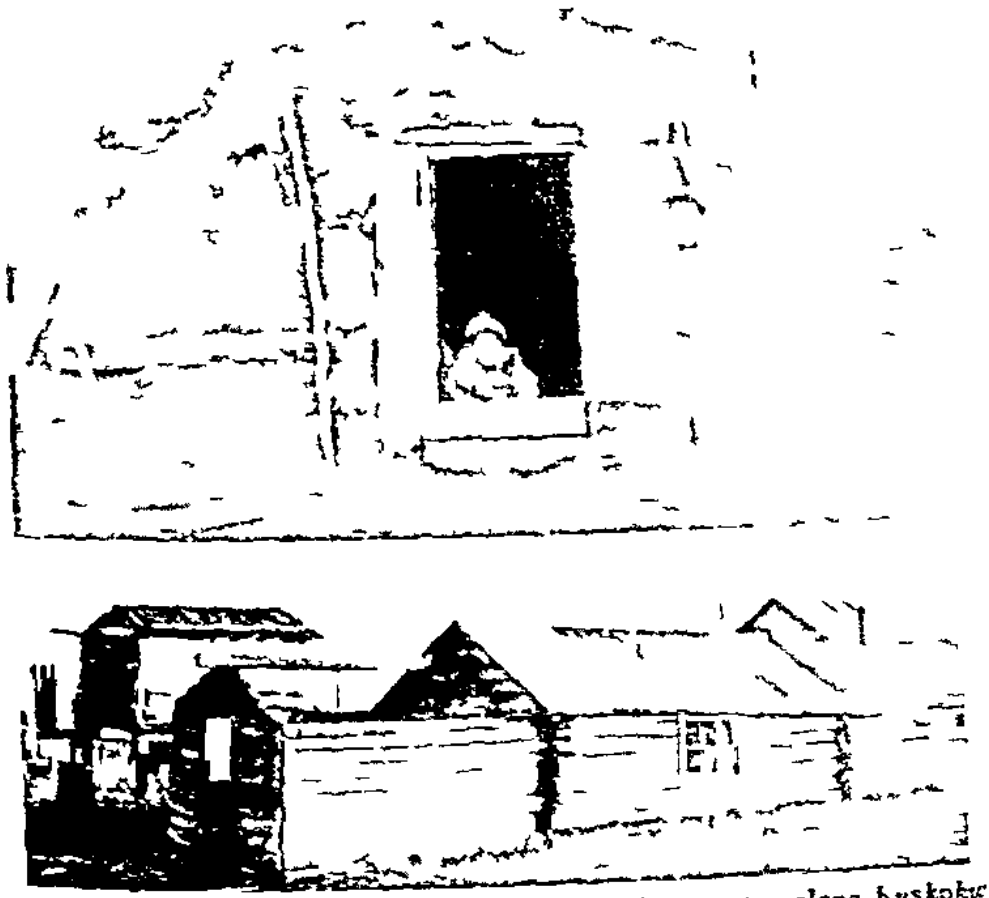


Figure 2 Typical Eskimo housing in Alaska tundra country along Kuskokwim River

Bethel Nothing could be done immediately for the patients at Chifnorik, but arrangements were made to bring those acutely ill at Akiachak down the river to Bethel on 8 October Laboratory service was not available locally, but throat smears and swabs from the patients at Akiachak were sent to Anchorage for examination A preliminary negative report for *Corynebacterium diphtheriae* was followed by a positive report on 9 October

Because of the imminence of the freeze up which paralyzes transportation by land, water, or air, the next three weeks were a frenzied period of examination, treatment and prophylaxis at most of the 60 villages in the area Two physicians and six nurses successfully aborted the outbreak with little regard for their personal health or physical safety The summary of the significant findings (table 1) obtained on one or two visits to each village is based on observation and on brief clinical examinations

TABLE 1 *Observation diphtheria outbreak 1952*

	Estimated population	Estimated number immunized	Suspected	Suspected death
Diagnosed by laboratory report of C diphtheriae mortem				
Akiak	170	130	3	—
Akiachak	188	125	20	2
Bethel	600		19	—
Kwethluk	240	180	12	—
Platinum	50	?	7	—
Negative throat swab				
Chefornak	106		23	6
Eek	140	125	4	—
Napakiak	120	120	4	—
Napaskiak	140	25	6	—
Tuluksak	115	100	4	—
Upper Kalskag	140	110	7	—

The symptoms reported by the hospital at Bethel were a dry parched and extremely painful throat combined with difficult and painful swallowing No history or instance of regurgitation of liquids through the nasal passages was elicited There was no report of a membranous pharyngitis observed in any patients by trained personnel until 31 October when an adult male attendant complained of the above symptoms

On 24 November after 24 days of calm 2 women and 2 children from the village of Akiachak (fig 3) were brought to the hospital at Bethel by dog sled All had the symptoms observed in the October wave including sore throat difficulty in swallowing and

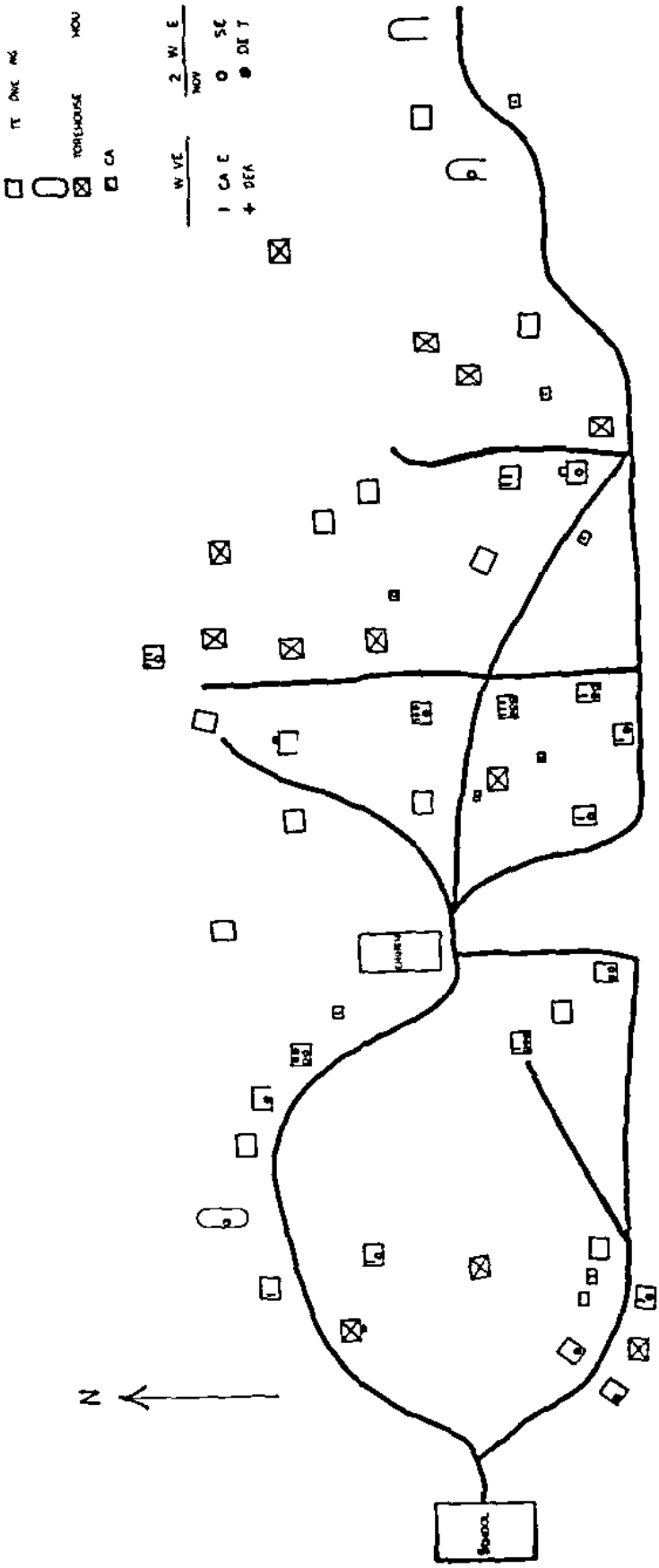


Figure 3 Map of distribution of patients with diphtheria in village of Akiachak indicates transmission by direct contact.

apparently respiratory muscle paralysis These patients appeared extremely ill and one of the women died within six hours She had previously been admitted on 8 October and remained hospitalized until 1 November when she was returned home On the second admission she had respiratory impairment with cyanosis rapid pulse and abdominal respirations Another woman, 32 years old had identical symptoms of dry mouth and pharynx and difficulty in swallowing and breathing She was cyanotic and her respirations were abdominal in character She was given artificial respiration and oxygen and, with two children was flown to the U S Air Force Hospital at Anchorage where she was seen by the author Physical examination revealed an extremely dry, beefy pharynx but no gross paralysis or paresis The nasopharynx larynx, and nasal cavities were dry and crusted She did not require artificial respiration but was given oxygen On the second day in the hospital she died of circulatory failure and toxic myocarditis A blood culture was positive for C diphtheriae

The two children improved in the hospital and after 30 days had negative cultures Examination of each revealed a dry, beefy throat crusty secretion and an overlying dry beefy red nasal mucosa The nasopharynx was clear Except for catarrhal otitis media the balance of the examination was negative Although the difficulty of these patients in swallowing was real the cause was actually the local inflammation of mucosa rather than paresis or paralysis In spite of some intercostal weakness of questionable degree there was no gross demonstrable paralysis The symptoms (sore throat and difficulty in swallowing) and physical findings referable to the nose throat and larynx were found in almost every instance in patients examined by the author

Laboratory findings aided only in establishing that there was diphtheria present in the vicinity as of 9 October and there after treatment by antitoxin and antibiotics (penicillin and streptomycin) was carried out as indicated by physical findings During the October wave according to clinical records six patients had positive cultures and were given antitoxin One woman after receiving 10 000 units of antitoxin died 3 days after admission Two white men (ages 54 and 40) were admitted with positive cultures, but without symptoms or findings They were each given 10 000 units of antitoxin and discharged Two male Eskimos (ages 40 and 7) were admitted and although positive cultures were not obtained they were given 10 000 units of antitoxin They improved clinically and were discharged on recovery

The wave occurring in late November and early December varied from the one in October because positive cultures could

not be obtained or identified at the laboratory in Bethel in spite of the fact that clinically the patients appeared identical Twenty-seven patients were admitted to the Bethel hospital between 30 November and 6 December 1932 with suspected diphtheria There were six deaths in this group, five were confirmed by laboratory and postmortem examinations The numbers were equally divided as to sex and ages ranged from 18 to 59 years One woman had been hospitalized previously and treated with antitoxin Two patients had other complicating factors of tuberculous pneumonia and toxemia of pregnancy Three other patients had diphtheria which was diagnosed during the first wave

There were 19 patients admitted with pharyngitis and difficulties in swallowing of varying degrees Examination revealed only the usual beefy throat and dry crusty nasal fossae Cultures failed to reveal *C diphtheriae* None of this group appeared acutely ill or remained in the hospital over five days All were given adequate doses of antitoxin (30,000 to 150,000 units) and none had subsequent complications

Thorough mirror visualization of the nasopharynx, hypopharynx, and larynx failed to uncover a diphtheritic membrane except in a native youth, age 18, with a fulminating tuberculous pneumonitis Another tonsillar membrane which was observed proved to be caused by pneumococci A postmortem examination of the trachea in a 20 year old man revealed a membrane which was clinically and microscopically diphtheritic in type Nose and throat cultures from this patient previously failed to show the organisms although he was observed to have had a pharyngeal membrane on admission

Ocular paralysis apparently occurred in 6 of the 31 patients in this series Only one of this group died Two patients had paresis of the ciliary muscle, one had marked ptosis of the upper lid, and all complained of blurring of vision A follow up study was not done on any of the patients with ocular symptoms

COMMENT

Despite the severity of the disease only four patients were recorded as acutely ill with the exception of those who died The absence of, or failure to observe, diphtheritic membranes in the majority of patients suggests the possibility of their occurrence in the paranasal sinuses This involvement accounts for many cases of so-called "walking diphtheria" in which the patients have only the symptoms of an acute sinusitis until the onset of neuritic or toxic complications

No obstructive lesions were observed in the patients involved in this outbreak The absence of [illegible]

[illegible] of immunization [illegible] dose of 10 000 [illegible] were also given

SUMMARY

In a group [illegible] 6 000 diphtheria [illegible] an outbreak [illegible] and December 1[illegible] adults

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During the reign of J[illegible] of united twins [illegible] them (after the fashion [illegible] and lived for [illegible] monster [illegible] Write down these [illegible] them" to be [illegible] and the other the [illegible] to hear " They also [illegible] guages and lived to the age of [illegible]

[illegible]

[illegible] (a form) [illegible] as each [illegible] possible [illegible] tonic [illegible] [illegible] It [illegible] centres with the [illegible] known to the [illegible]

[illegible]

POSTCHOLECYSTECTOMY SYNDROME

ROBERT T GANTS *Colonel MC USA*

RECURRENCE or persistence of symptoms following cholecystectomy is distressing to the patient and the surgeon Such postoperative symptoms whether due to biliary duct obstruction, inflammation, or spasm, can be avoided in most patients if the proper operative procedure is confined to those in whom definite biliary tract disease is proved [1 2] A certain few patients will have recurrences of their symptoms, or other complaints, referable to dysfunction or disease of the biliary system no matter how correctly the operation was performed

The persistence of symptoms following cholecystectomy is commonly referred to as postcholecystectomy syndrome, biliary dyskinesia, and biliary dyssynergia A review of current literature indicates that cholecystectomy properly performed for cholelithiasis can be expected to relieve symptoms in as high as 90 percent of the patients, whereas cholecystectomy for cholecystitis without stones may result in 40 percent failure as far as relief of symptoms is concerned [1 3]

Numerous reasons for persistence of symptoms following cholecystectomy have been advanced by various authors who have reported illustrative patients successfully treated by elimination or correction of the causative factor The most common cause for persistence or return of symptoms is an error in diagnosis and failure to recognize the presence of pancreatitis hepatitis, peptic ulcer, diaphragmatic hernia, duodenal diverticulum, renal disease, or spinal nerve lesions

In order to make a correct diagnosis of cholelithiasis, the patient should have a typical history of biliary colic on several occasions with more or less persistent symptoms of dyspepsia, nausea vomiting, intolerance to fatty foods and perhaps jaundice, associated with the detection of abdominal tenderness in the region of the gallbladder These symptoms and findings should be corroborated by nonvisualization of the gallbladder upon repeated cholecystographic examinations or by the radiologic visualization of stones Once a correct diagnosis of chole

From 98th General Hospital Colonel Gantt now at Walter Reed Army Hospital Washington D C

group of 0 to 5 years gives added substantiation to the efficacy of immunization in infancy Diphtheria antitoxin was used in a dose of 10 000 units Penicillin streptomycin and aureomycin were also given

SUMMARY

In a group of Alaskan villages with a population of about 6 000 diphtheria was diagnosed in more than 100 patients durin an outbreak which occurred in two waves in October, November and December 1952 There were eight deaths reported amon adults

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During the reign of James IV there was born in Scotland a set of united twins or Siamese twins as we now sometimes call them (after the famous Siamese couple who were born in 1811 and lived for 63 years) The King took a keen interest in the monster which had two heads and two bodies, but from the Waste down there was but one personage King James caused them to be taught to sing in two parts, the one the Treble and the other the Tenor which was very sweet and melodious to hear They also learned to speak a number of different lan guages, and lived to the age of 28 years

—DOUGLAS GUTHRIE M D
B t h M d l J urn l

Opium (a fyun) w as introduced into China from Arabia or Iran perhaps as early the Sung dynasty (900 1200 A D) It is entirely possible however that a narcotic like opium was known in prehistoric times associated with the secret rituals of the early tribes It is probable that initiation was accompanied in some countries with the use of drugs Opium was undoubtedly known to the early travelers

—FDWARD H HUME
B H t f th N w Y k A ad my f M d

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From the Gen ral Hospital Col Gants now with W l Reed Army Hospital Washington, D C

lithiasis has been made it does not necessarily mean that conditions such as a peptic ulcer or diaphragmatic hernia do not coexist and cause some of the symptoms Therefore it behooves the physician to complete the differential diagnosis because occasionally a gallbladder containing stones has been removed while some other condition was the cause of symptoms A complete physical examination is essential Laboratory studie during an acute attack are helpful to rule out hepatitis and pancreatitis Roentgenologic examinations of the lungs and gastrointestinal and renal tracts aid in ruling out or in making an additional diagnosis of peptic ulcer diaphragmatic hernia pulmonary lesions or renal calculi

Another cause for symptoms following cholecystectomy is the undetected or retained stone in the common bile duct Best gave the surgeon an escape for overlooking a stone in the bile duct when he called attention to hepatolithiasis He stated that 7 percent of all patients with cholelithiasis have stones in the liver and that these may be the source of common duct stones removed at a econd operation Persistent symptoms can be due to anatomic changes such as stricture formation and possibly distortion from adhesions occurring in the biliary tract after surgical trauma Residual biliary tract infection has also been suggested as another cause of symptoms but is discounted by Womack and Crider Sensitivity to residual bacterial infection has been considered as a cause for persistence of symptoms after removal of an infected gallbladder

Anomalies of the sphincter of Oddi and the ampulla of Vater have been reported and discussed by Cole and Crove They reported a patient with congenital stenosis of the sphincter of Oddi who obtained relief of symptoms when it was sectioned Another patient with a narrow opening was treated by sectioning the sphincter with questionable relief True spasm of the sphincter of Oddi is considered to exist but the same authors considered the lesion very rare Chronic sclerosing pancreatitis closing the pancreatic portion of the common duct also may cause symptoms

Best[3] considered partial occlusion of the bile ducts with thick viscid or inspissated bile collections of mucus blood clots debris and fine particles of precipitated cholesterol or calcium bilirubin to be a significant factor in the recurrence of symptoms following cholecystectomy He stated that these substances can remain in the common duct and become a nucleus for the later development of common duct stones He also was of the opinion that spastic or atonic conditions of the choledochal sphincter play a role in the postcholecystectomy syndrome and that these conditions may be associated with bile stasis and infection

He recommended the production of a thin, watery bile following cholecystectomy. This can be produced by the administration of decholin (dehydrocholic acid) which is a choleretic and a hydrocholeretic drug. This drug can be administered as a part of a "flush" which he prescribed for the seventh and fourteenth postoperative days.

Womack and Crider,[5] and more recently Troppoli and Cella,[7] have established the fact that neuroma formation secondary to trauma is a definite factor in the cause of symptoms following cholecystectomy. The former have explained the neuroanatomy of this region. They recognized that the cystic duct stump and the reformed gallbladder were causative agents but believed that associated neuroma which was produced by trauma was more important. This belief was based on anatomic, histologic, and pathologic findings and on the observation of patients with reformed gallbladder or persistent stump who had symptoms regardless of the presence of stones. They contended that the development of pain several months after cholecystectomy rather than immediately after operation, supported their view of neuroma formation. Most surgeons prefer to leave a small cystic duct stump rather than to endanger the common duct by excising the cystic duct flush at its junction with the common duct. It has been suggested that the possibility of neuroma formation is diminished by completely stripping the ductal structure of nerve elements in this area and that the surgeon can then safely leave a small cystic duct stump.

CASE REPORTS

Case 1. A 27 year old woman was admitted to this hospital because of a severe pain in the epigastric region radiating to the left and right upper abdominal quadrants. The pain originated as a severe heartburn 5 hours prior to admission and was accompanied by nausea. Symptoms referable to gallbladder disease began when she became pregnant 1 year prior to this hospitalization. They persisted during pregnancy and became progressively worse after delivery of her baby.

The patient was moderately obese and had exquisite epigastric and upper right abdominal tenderness. A cholecystogram revealed a functioning gallbladder with many nonopaque biliary calculi. All other studies were normal.

A cholecystectomy was performed without technical difficulty. The patient's postoperative course was complicated by an attack of upper right quadrant and epigastric abdominal pain on the sixth postoperative day which disappeared after vomiting. She described the pain as "just like my gallbladder attack." She was discharged from the hospital on the tenth postoperative day.

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with catheters and Bakes dilators These ducts were normal in size, consistency, and contents A long armed T tube was inserted so that one limb extended into the duodenum The appendix was removed and the abdominal incision was closed with the T tube protruding through a separate stab wound



Figure 1 Cystic duct stump of "reformed gallbladder"

The pathologic report was chronic nonspecific inflammation without evidence of neuroma The patient's postoperative course was uneventful She was discharged on the tenth postoperative day The T tube was removed on the ninetieth postoperative day A biliary sinus persisted for only 24 hours Cholangiograms prior to removal of the tube were normal Since the operation she has been free of symptoms referable to the biliary tract and pancreas

SUMMARY

Two patients illustrative of the postcholecystectomy syndrome have been presented with a review of recent literature on the subject, and a discussion of its cause, prevention, and management One patient with mild symptoms illustrated the causative factor of spastic or atonic choledochal sphincter associated with bile stasis, and was successfully treated by conservative means The second patient had a "reformed gallbladder" which required surgical excision, duct exploration, and T tube drainage In performing cholecystectomies, it is my policy to completely strip the cystic duct of all its adjacent structures down to its junction with the common duct I believe that this technic has prevented recurrence of symptoms following removal of the gallbladder

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The s bject of cardi c resusc t tion is of great importance because delay of only a few minutes in beginning treatment may make the dif fer nce b tween dead o di abled patient and a l ving d ell one It s impo tant to have a predetermined plan of action and to have equ pment available in order to avoid delay Cardiac rrest or e tr cula fibrillation may occur during any surgical procedure e en m tons llectomy with th patient u der local anesthes a It can occur dur ng b o choscopy or esophagoscopy hence anyo e who p forms ma jor o mino surgery or anesthesia must be familiar with the techn c f rdiac r uscitat on The cardiologist or internist who pe f ms c thet zati n of the heart not only sh uld be awa e of the possibility that ca d ac arre t or ventr cular f brillat on may develop dur ng the p ocedure but also mu t be prepared to treat it s nce there is usually n time t all som one else to resuscitate the patient

—SANFORD E LEEDS M D
n the *Journal of the American M d al As o iat n*

Scientific Translations Center Established

The Nat onal Sci nce Foundation now has facilit es in the Sc entif c Transl tion C nter Sc en e Division Library of Congress Washing ton D C for h ld ng a d photodupl cating fore gn scient fic transla tion Init lly major empha is will be on those from Russ an sci n tific journal Ph to tats or enlarged m cr prints (1 to 10 pages) may be purchased fo $1 25 those of 11 to 15 pages $1 75 and m c of lms (1 t 50 pag s) $1

A PREVENTIVE DENTISTRY PROGRAM

The U S Air Force Plan

KENNETH R ELWELL *Lieutenant Colonel USAF (DC)*

CAN an effective program be developed to prevent and reduce oral diseases among military personnel?

The U S Air Force's Preventive Dentistry Program is designed to do this and to complement the oral rehabilitation services by modern treatment It is planned to provide an annual oral prophylaxis for each military person and to educate and interest all Air Force personnel in developing effective daily oral health habits such as correct, routine brushing of teeth after each meal and reducing carbohydrate intake

Such a program is important to the military services because most inductees are in the age group having the highest rate of dental decay and nearly every recruit is in need of numerous fillings, full or partial dentures, periodontal treatment, and/or removal of infected teeth The Government bears the heavy costs of maintaining dental clinics, equipment and professional staffs, as well as tremendous losses in military productivity of patients undergoing treatment.

RESPONSIBILITIES AT VARIOUS ORGANIZATIONAL LEVELS

The current Air Force plan of an intensified preventive program was announced in a publication by the Dental Services, Office of the Surgeon General, Headquarters, U S Air Force, which recommended a recent plan[2] established by a major Air Force command to improve oral hygiene practices and oral health education at its bases

The program imposes definite responsibilities on commanders at all organizational levels They are expected to organize and monitor programs which fulfill the objectives, provide the necessary space, personnel, and equipment authorizations plan the training of personnel essential to the program, and give assistance in its development.

From the Office of Assistant for Dental Services Office of the Surgeon General Headquarters U S Air Force Washington D C

372 09 O 51 6

The base dental surgeon actually establishes the program He analyzes the local ituation appoints a qualified preventive den tal officer and supervises his activities

The preventive dental officer usually a periodontist, is the key to an effective program He is a highly competent officer selected to develop the preventive program of the air base He *has dual responsibilities First he performs professional duties* Inasmuch as the annual dental prophylaxis is one of the goals of the present program the preventive dental officer supervises the accomplishment of this service in the dental clinic Second he promotes co ordinates and develops all phases of oral health education This instruction involves the principles and methods for achieving good oral hygiene dental benefits incident to re ducing carbohydrate intake, and a practical knowled_e of dental health designed to gain the co-operation of the individual in bet ter care of his mouth Oral health reading material in reception *rooms and printed instruction sheets on special dental subjects* aid the local program Other means of promoting local programs such as integration of the dental with the local information and educational programs and co-ordination of activities with base preventive medical officers are used by alert dental preventive officers

PROGRESS MADE

What progress has been achieved in the clinical prophylaxis and oral educational phases of the program? Despite large in creases in Air Force strength from 1951 a steady proportional increase in the number of prophylaxis has been accomplished Much of the progress achieved in the past fiscal year is a direct result of the planning and training accomplisl ed from 1950 to 1952 Figure 1 shows the progressive development of the oral prophylaxis ratio from 1 7 percent in May 1951 to 2 8 percent in May 1952 and to 4 3 percent in May 1953 *Calculations of per* centages are based on current Air Force strength in each month indicated Continued progress and expansion of the oral prophy laxis service at each base to a *monthly* ratio of about nine per cent is needed to provide an annual oral prophylaxis for all Air Force personnel

The oral health educational phase of the program has been progressin_ well Good results can be expected when active and interested officers are given specific responsibility for the suc cess of such a special pro_ram Letters and reports from air bases which have carried out this educational phase of the program in dicate that it is resulting in reduction of sugar intake better daily hygiene habits and an increased interest of airmen in their oral health The results in terms of oral disease prevention must be determined after the program has been fully developed at more air bases

Obstacles remain which require planning and action at various administrative levels Some bases have limited facilities and equipment, personnel may be inadequate in numbers or in train ing, or there may be other problems

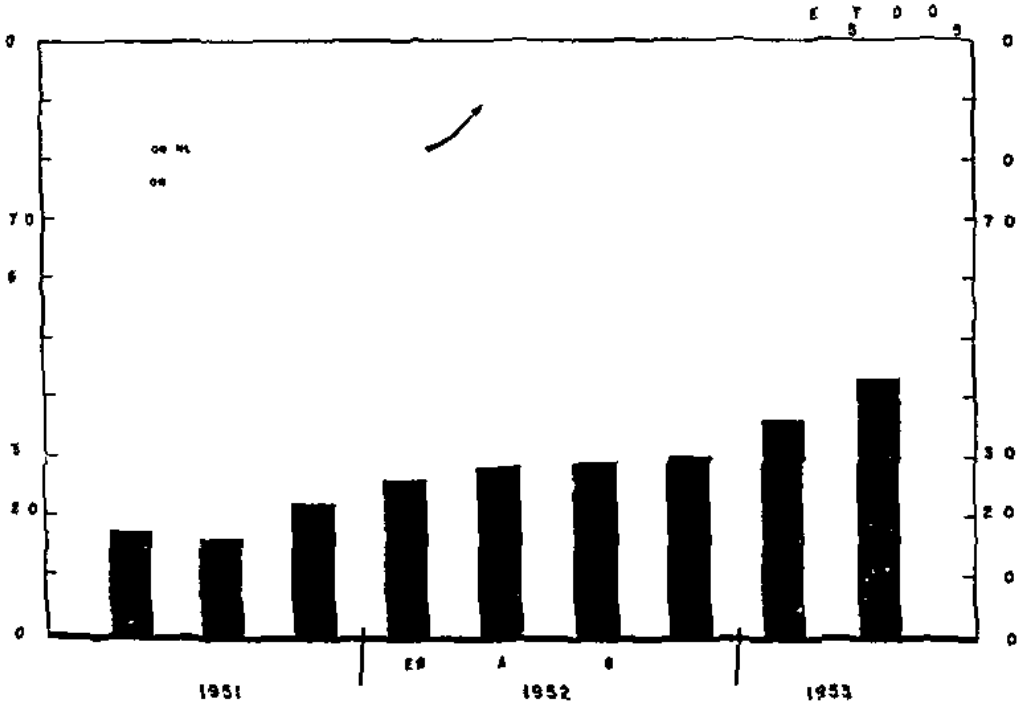


Figure 1 Percent of U S Air Force military strength receiving clinical oral prophylaxis.

FUTURE PREVENTIVE MEASURES AND RESEARCH

The future offers much promise for more effective prevention and/or control of oral diseases through measures other than oral hygiene The possibilities include the use of ingested or topi cally applied fluorides, further developments of antibiotics, and scientific or research advances in dental treatment

Fluoridation seems to offer the greatest potentialities in pre ventive dentistry Its status is of significant interest because fluoridation of public water supplies is now an accepted public health method for partial control of caries [5] Official figures from the U S Public Health Service which show that fluoridated com munity waters, as of 15 July 1953, now supply 790 communities serving 14,486,799 residents, also, 15,650,000 other residents of 370 other communities have approved fluoridation of their pub- lic water supplies although actual fluoridation has not been start- ed

Military services have delayed fluoridation of their water sup plies This policy has been based on recommendations of the National Research Council[7, 8] which has recognized the positive benefits of fluoridation for children and has stated that some

evidence evaluated indicates a measure of protection for adult teeth However it was recommended by the National Research Council that fluoridation of military base water supplies should be delayed until more evidence as to its benefits for those of military age groups is developed Although some additional evidence has been obtained it has not been considered adequate to change the military policies concerning fluoridation However military policy on the matter is now being reconsidered on the basis of pertinent research findings Studies of the effects of topical applications of fluoride solutions to teeth of young adults are in progress [1] Evaluation of results as they pertain to military personnel will follow in 1954 when these studies are completed

As new and more effective means for combating oral diseases in the military services are developed they will be incorporated into the preventive dentistry program Every effort will be made to continue development of a progressive and effective program in the United States Air Force

SUMMARY

A preventive dentistry program which complements and supports the oral rehabilitation services in the prevention and reduction of military dental needs has been established in the Air Force It is planned to provide a minimum of one annual oral prophylaxis for each military person and to educate and promote the personal interest of airmen in good daily oral health practices Responsibility for developing the program is placed at various organizational levels Despite an increase in Air Force strength, the oral prophylaxis ratio increased from 1 7 percent in May 1951 to 2 8 percent in May 1952 and to 4 3 percent in May 1953 Reports from air bases indicate that the educational phase of the program is progressing with favorable results

Fluoridation of military water supplies is now under reconsideration recent research findings will be evaluated concerning possible benefits to those served by military communal water supplies Future preventive methods and research results which prove effective in controlling the incidence of oral diseases will be used to insure progressive development of this program

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Maternal mortality rates have gradually been reduced to satisfactory levels but stillbirth and neonatal death rates have failed to decline commensurately Recent statistics * show a decided relative increase in infant deaths during the first 24 hours of life The combined stillbirth and neonatal mortality rate in the United States is 5 percent and represents a loss of over 150 000 lives annually In 1949 one out of 70 pregnant women failed to produce a living child

—HUBERT L ALLEN M D
in the Illinois Medical Journal

As a class physicians are inclined to be individualistic with an abundance of self confidence in their ability and knowledge It is the presence of these innate characteristics which has led most of us into the practice of medicine and their proper use is responsible for much of th good we accomplish in our chosen tasks In order that we might reap the full benefits from a life of service, it is essential that we accept the same standards of behavior which we have set for the patients under our care

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—JAMES S KLUMPP M D
n th West V ginia *Medical Journal*

ARMY PREVENTIVE MEDICINE TECHNICIANS

Their Schooling and Background

JOHN D FLINTJER *M j r MSC USA*

THE majority of the preventive medicine technicians (MOS 1119) in the Army have attended the Preventive Medicine Enlisted Course 8 F 20, at this school A number of technicians earned their MOS by dint of hard work in the field and later some of these have attended school They almost invariably benefited from the formal training

The purpose of the course is to train selected enlisted personnel in the basic principles and technics of military preventive medicine in order to qualify them to assist in the survey and control of environmental health hazards " The program of instruction is summarized in table 1

This 12 week course is divided into three parts entomology, sanitary engineering and general sanitation subjects No attempt is made to produce specialists in these separate fields The fundamental purpose of the instruction is to develop a man who will quickly and readily fit into sanitation work with minimal on the job training The course is conducted by lectures (50 percent) laboratory exercises (20 percent) and field applications (30 percent)

ENTOMOLOGY

In entomology the stress is on the identification of medically important arthropods and their hosts particularly rodents but other related arthropods (which are of economic importance) are emphasized enough to prevent a distorted outlook The students then learn the properties, effectiveness use, and dispersal of insecticides and other control measures Simple identification keys are used because most of the students lack basic scientific training Ordinarily technicians in their work are required only to identify genera but because mosquitoes and fleas are so important in the spread of disease their species identification is taught The laboratory lessons include detailed study of microscopic and macroscopic specimens and familarize the student

F m M d I F ld S S h l U S A my F S m H T

ith the microscope and enable him to identify important in ects They learn to handle the same laboratory equipment that ey will use in the field They are shown how to collect, prepare, nd properly pack specimens for shipment They learn that their ork is not the end all of epidemiology, but only the first step n a total investigation All of the laboratory work is closely cor elated with lectures and field instruction (fig 1)

TABLE 1 *Preventive medicine procedures course*

(12 weeks 528 hours)

Subject	Hours
Reserved for commandant	67
Technical instruction	381
General instruction	(26)
Military preventive medicine	(11)
Microbiology	(12)
Control of respiratory diseases	(3)
Insect and rodent-borne diseases	(10)
Insect and rodent control	(93)
Intestinal diseases	(12)
Mess sanitation	(24)
Venereal diseases	(6)
Prevention and control of miscellaneous diseases	(7)
Water supply and purification	(70)
Waste disposal	(74)
Housing	(6)
Industrial hygiene	(5)
Preventive medicine statistical reports and regulations	(6)
Miscellaneous preventive medicine	(25)
Map reading	(13)
Veterinary corps food inspection	(6)
Nontechnical instruction	85
Troop information and education	(11)
Inspections	(44)
Drill	(11)
Physical training	(16)
Total hours	532

The technicians learn to associate vectors with disease. Only enough instruction about the clinical aspects of disease is furnished to give them a general impression of the nature of the conditions Etiology is covered with sufficient emphasis to develop ecologic understanding The epidemiology of disease is comprehensively considered because these technician will be concerned not only with disease prevention, but also with tracking down the sources of infection Their job is to recognize and [illegible] mental factors of disease

Entomology field exercises include surveys for insects and rodents demonstrations and inspections with the main emphasis on the control procedures For instance the men take counting grids into fly infested areas and learn to estimate the fly population At the same time they learn why the flies are present and what can be done to eliminate them The same is true when they search for mosquito breeding places While collecting specimens they acquire a knowledge of the habitats and habits of ticks and mites with the aim of developing control measures When the men go into a tick infested area they learn by practice to impregnate clothing with repellents In aerial dispersal of insecticides



Fig 1 Student making survey for mosquitoes A coolie body is protected with a good netting

the students are shown how to use special equipment and how to direct the pilot by ground control flags and markers The students are taught to prepare insecticides and repellents and the relative effectiveness of each They use the control equipment most suitable for each preparation while studying the methods of application They see examples of DDT resistance, demonstrated with live cultures of especially reared flies The students make rodent surveys learn to recognize signs of rodent infestations how to trap rodents and comb them for ectoparasites which they subsequently study and identify in the laboratory The tech

icians study the morphology, life cycles, and habits of the ar iropods as related to their control With a little supervision, most of the graduates can give real assistance in the epidemiologic investigation of arthropod borne diseases

SANITARY ENGINEERING

Instruction in sanitary engineering acquaints the students with methods and problems of water supply and purification and disposal of sewage and other wastes To give them a well rounded outlook, they study expedient field disposal methods and the integrated sanitary systems servicing communities

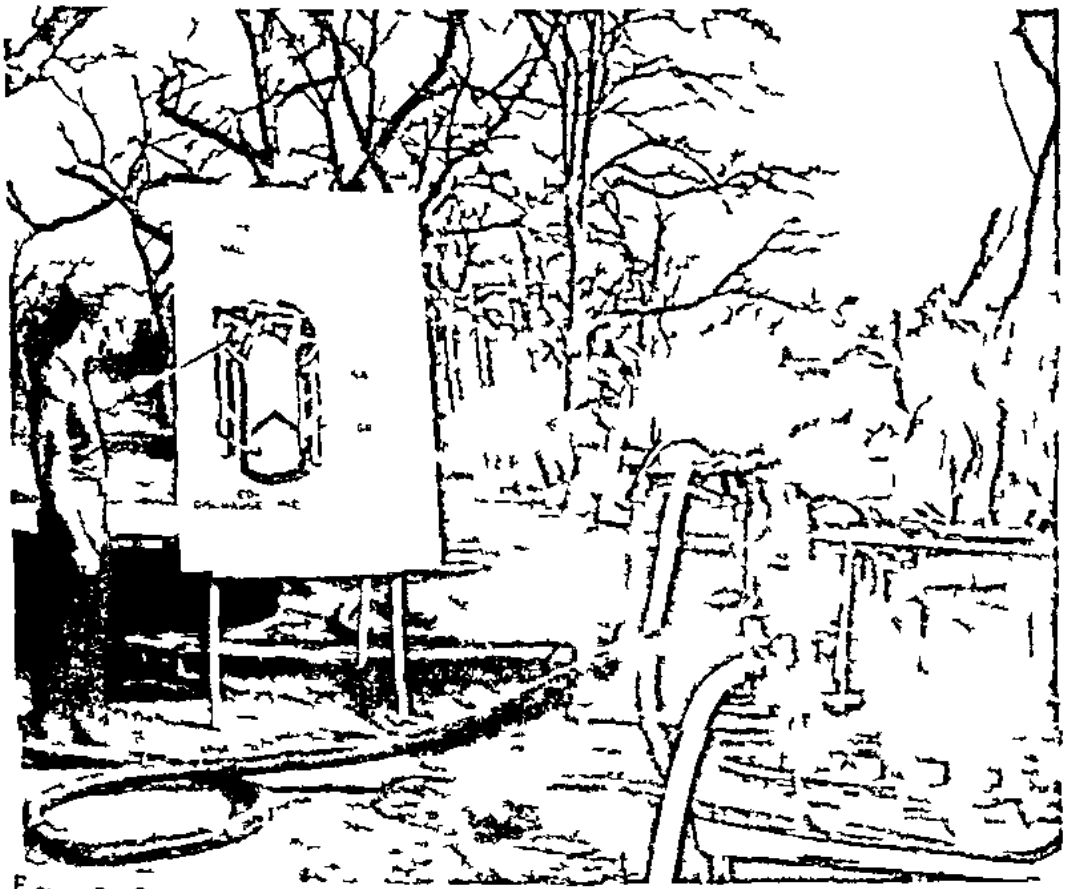


Figure 2 Students receiving instruction in pressure sand filtration used in water treatment in the field.

Specifically the students first study the elementary chemistry of water They consider the favorable and unfavorable elements and compounds dissolved in various waters In the laboratory they determine the chlorine demand, chlorides, and hardness of water They then study the biologic contaminants of water With samples which they collect and label actual bacteriologic analyses are made and demonstrated From the results of the chemical and biologic analyses they determine the potability of the water Surveys to determine the location and suitability of water sources are made on field trips In preparation for this training basic

water mathematics (such as measurement of streams and stream flow to determine the quantity of water available) are taught

The study of sewage and sewage systems is the next step Initially the technicians learn the important facts about sewage its character composition, and health significance At this time the study of intestinal diseases and their control is introduced They learn that sewer and water pipes may be laid in the same channels hence they must know how to look for leaks seepage and possible water contamination They study cross-connections learning what they are, where to look for them and how to recognize and correct them The effluents and the necessity for their treatment in regard to stream pollution stream management, and the problems encountered in this connection are studied

There is extensive demonstration of field sanitation methods especially for the treatment of wastes Method of operation and construction of such apparatus as the inclined plane incinerator immersion heaters and other equipment and the proper disposal of garbage and trash are included The proper methods of handling garbage cans and racks at mess halls bakeries and meat-cutting plants are demonstrated The operation and limitations of a sanitary fill and a large incinerator are observed

Sanitary engineering instruction includes a study of pumps pipes tanks and some of the operational problems that can develop in their use and enables the technicians to assist a preventive medicine officer competently in the inspection of various sanitary installations During their instruction they are taught to operate an engineer water point In an emergency each technician could operate such a point for field troops or to replace disrupted post or civilian supply systems (fig 9)

GENERAL SANITATION

The third phase of the course covers sanitation in general The technicians are schooled in the nature and epidemiology of diseases (such as venereal and respiratory) that are not arthropod borne They make field trips in which multiple phases of sanitation and hygiene are integrated Emphasis is placed on the correlation of various subjects which they have studied Previous teaching is summarized and conclusions are drawn by demonstrations and applicatory exercises

The instruction in microbiology covers the morphologic and cultural characteristics of bacteria an introduction to pathogenic microorganisms infection and resistance and immunology The information is elementary but designed to provide enough basic understanding to give meaning to the other training

Because preventive medicine technicians may be employed in some phases of venereal disease control they are given basic

instruction in the clinical aspects, symptomatology, etiology, and general epidemiology and control of the venereal diseases

The etiology, symptomatology, and epidemiology of respiratory diseases are discussed and the transmission of them is correlated with housing and ventilation

The hygiene of food handlers and their inspection, along with *mess sanitation* and inspection are intensively studied In mess inspections, the technicians are taught not only the sanitary aspects, but also the personnel relations aspects involved because they generally work in a supervisory and advisory position The distinction between supervisory and command prerogatives are instilled

The students are taken on field trips with sanitarians from the San Antonio Public Health Department These sanitarians demonstrate the inspection, operation, and sanitation of meat-processing plants, dairies bottling works, restaurants, barber and beauty shops, and trailer camps The technicians are shown problem housing areas and some of the corrective measures employed in these areas They also study an area where there is a drainage problem, see the conditions involved, and learn what can be done to improve such situations

During the *general sanitation phase of the course, the main* objective of instruction is to integrate prior and current knowledge The men are shown by the study of disasters that disruption of sanitary facilities increases epidemic disease, creates insect- and rodent-control problems and causes overcrowding in houses, which results in the spread of respiratory diseases

PREREQUISITES

The present 12 week course was instituted in May 1950 The students who are accepted for training must have finished basic training, have a least a year to serve on completion of the course, and be below grade E 5 An AGCT score of 100 or better in area III is a prerequisite Prior experience or an interest in sanitation is desirable Between May 1950 and January 1953, admissions to the course numbered 1,112 Of these 918 graduated This attrition rate of 13 2 percent is largely accounted for by losses due to academic deficiency The educational background of the graduates of this course by *percentage is as follows* College graduates, 8 high school graduates with some college, 9, high school graduates 41, grade school graduates with some high school 19 grade school graduates, 2 5, and incomplete grade school 2 3 The average class was composed of 50 students Currently (1953) the authorized class size has been reduced to 40 students, a size which enables each man to receive an adequate amount of individual attention

CLASSIFICATION AND ASSIGNMENT

When the students have completed this course they are classified as Preventive Medicine Technicians MOS 1119 semiskilled They are not yet qualified sanitarians but are well fitted for an apprenticeship which need not be long If on the job trainin in their first assignment is good most of them will become first-rate skilled preventive medicine technicians

These technicians may be used in Preventive Medicine Survey and Control Detachments (T/O & E 8 500 LA and LB teams) and in Preventive Medicine Companies (T/O & E 8-11) either in oversea or Army area commands Preventive medicine officers in various headquarters need enlisted assistants these preventive medicine technicians are trained to fill those jobs They have proved useful in such organizations as Army area laboratories and medical general laboratories In some assignments they have been called upon to assist in venereal disease control especially in contact tracing

These men have an understanding of the effect of environment on health and know how adversely an unfavorable one may affect military operations They have learned something of environmental control for better public health They have a basic foundation and are potentially able to learn much more with proper supervision

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Land Mine Injuries

In the t e tment of land mine t ttoo dur ng Wo ld Wa IIa nte st ng bservat on was made Aft r abra ion of the fac skin h d be n carri d to th m x mum with n lim t f s fety th e usu lly r main d a vari able numb r of small is l ted deposits n the subcutan ous tis u By p r g these sp t with k n hook and making tr ctio pward they were eas ly emoved by minut llipt cal i ci ion a d th edges ap p ox mat d by o or two f n sutur s The resulting r wer arely vi bl even o1 clo examination If by c mpar so th d pos ts w r x i ed through th int t skin without abrading the ep der the usual t ing devel ped

—P C IVERSON M D
in Pla tic a d R nst u t Surg ry

REVERSIBLE RENAL INSUFFICIENCY

Report of a Case

BERNARD BLOOM M D

GEORGE ALVARY *Lieutenant Colonel USAF (MC)*

RENAL insufficiency, due to remediable types of renal or lower urinary tract disease, occurs frequently enough for the condition to be suspected in every patient manifesting this syndrome Thorn[1] suggests the following remediable types of chronic uremia (1) urinary retention secondary to obstruction, (2) chronic parathyroidism with renal calculosis, (3) chronic pyelonephritis without hypertension, (4) salt-losing" type of chronic nephritis (5) intoxication with irradiated sterols and (6) subacute bacterial endocarditis

We are primarily interested in the first group Obstructive lesions may be located supravesically or intravesically, the end result being uremia in each instance The improvement of uremic patients with obstructive lesions depends upon the reversibility of the renal damage in the functioning parenchyma which remains Therefore, the sooner treatment is instituted the better the outlook

Other important factors are the degree of relief of chronic obstruction attainable and, in most cases, the effectiveness of modern chemotherapy in reducing the associated urinary tract infection In patients with long standing obstructions and organic damage to the urinary channels, the newer drugs have made corrective surgery safer The patient illustrates the relief of uremia by correction of an obstructive lesion that had been asymptomatic and unsuspected for many years

CASE REPORT

A 20-year old man was admitted to the hospital on 5 January 1951, with the chief complaint of dull aching pain in the right lower abdominal quadrant and right lumbar region of 6 hours' duration and increased frequency of urination of 10 days' duration The provisional diagnosis on admission was acute right pyelonephritis On the day of admission he voided hourly and complained of burning There was no history of chills, fever, or gross hematuria Prior to the onset of urinary frequency, the pa

From U S Air Force Hospital Westover Air Force Base Mass Dr Bloom is consultant in urology

tient had considered himself in good health and had been able to perform all duties The past and family histories are non contributory

Physical examination revealed a markedly undernourished and dehydrated young man who was lethargic and appeared chronically ill His temperature was 100 F pulse 90 and blood pressure 170/1?0 The abdomen revealed moderate tenderness to deep palpation in the right lower quadrant, although there was no mus cle spasm or rebound tenderness present Moderate tenderness was present over the right costovertebral region

On admission the following laboratory test values were ob tained red blood cell count 2 450 000 leukocytes 12 000 urine loaded with white blood cells culture positive for non hemolytic staphylococcus The nonprotein nitro_en 133 m The phenolsulfonphthalein test revealed no excretion in 2 hours Urine concentration was fixed at 1 010 specific gravity On ?6 January 3 weeks after admission the nonprotein nitrogen was 200 m After several weeks of catheter drainage the nonprotein nitrogen was 65 mg on 9 February On 16 March 2 weeks after trans urethral resection the nonprotein nitrogen was 48 m_ on 18 April 48 mg The urine remained infected throughout his hos pital stay

Following admission the patient was given sulfadiazine and later streptomycin After 3 weeks of antibacterial therapy he was seen in urologic consultation with the request for retro- grade pyelograms since intravenous pyelography failed to reveal discernible dye in the urinary tract in films taken at 5 15 ?5 45 and 60 minute intervals At this time the blood pressure was 200/120 and the nonprotein nitrogen was 200 mg per 100 cc The patient had been considered as having chronic glomerulonephritis with severe hypertension The presence of pyuria unilateral flank pain frequency and fever however suggested that a urolo ic factor might be responsible for the entire syndrome of renal in sufficiency and its consequences Because his right side had been symptomatic a right sided pyelo_ram was first done A No 21 French Brown Buerger cystoscope was passed with ease and 900 cc of hazy residual urine was obtained The bladder wall showed coarse trabeculations grade II and on the ri ht floor a diverticular orifice was present Both ureteral orifices appeared to be of normal size shape appearance and location The bladder mucosa revealed chronic inflammatory changes throughout A No 6 French ureteral catheter was passed up the right ureter to 26 cm without meeting obstruction There was a constant flow of hazy urine from the ureteral catheter Over 50 cc of this urine could be aspirated Roentgenograms revealed the ureteral catheter lying in a coiled position in the region of the

lower ureter with its tip extending to the level of the second lumbar vertebra Retrograde pyeloureterograms revealed an extreme degree (grade IV) of hydro-ureter and moderately severe hydronephrosis (fig 1) The filled ureter resembled a coil of small bowel The lowest extent of the ureter ended abruptly in a smooth manner at the ureterovesical level The ureteral catheter was removed and an indwelling No 18 French Foley catheter placed in the bladder for constant drainage of the chronically distended and hypertrophied bladder Several days later cystoscopy with left ureteropyelography revealed hydro-ureter and hydronephrosis, the hydro-ureter being considerably less than that present on the right

After 1 month of constant urethral catheter drainage, the nonprotein nitrogen had fallen to 65 mg per 100 cc The anemia had improved considerably with only one blood transfusion On 3 March under spinal anesthesia, transurethral resection of the hypertrophied vesical neck was done Seven days later the residual was only 30 cc , 2 weeks postoperatively there was no residual and the nonprotein nitrogen was 48 mg per 100 cc Intravenous pyelography 3 weeks postoperatively, revealed fairly good concentration within 15 minutes and some slight diminution in the degree of hydronephrosis The patient s blood pressure had dropped to 120/80 and he had gained 20 lb , but the urine remained infected in spite of various chemotherapeutic and antibiotic agents Except for weakness the patient was asymptomatic when he was discharged on 6 June Five months later he was separated from the service and entered college

COMMENT

The striking features of the findings in this patient are

1 The gradual development of an extreme degree of bilateral hydro-ureter and hydronephrosis without symptoms calculi, or clinical evidence of infection until the final stages of uremia

2 The comparatively rapid return of renal function in an obstructive lesion after catheter drainage and removal of the obstruction The return of function was greater on the side showing the higher degree of ureteral dilatation In the tract capable of greater ureteral distention, a greater saving of kidney parenchyma has resulted

3 The question of additional obstruction at the right ureterovesical junction due to relative obstruction from disproportion caused by extreme ureteral dilatation However, after the patient responded well to transurethral resection of the vesical outlet and intravenous pyelograms revealed relatively good return of function on that side, no other surgical procedure was done

Fig 1 R gr de

py l g m (A) I fi (B) t h

It may be clinically impossible to make a positive differential diagnosis between Bright's disease and a urologic condition resembling glomerulonephritis when the patient is first seen in a state of renal insufficiency Excretory urograms in chronically ill patients with a nonprotein nitrogen over 70 mg per 100 cc are frequently made, but they furnish little information because most of these patients have insufficient renal function remaining to excrete discernible amounts of dye The fear that urologic instrumentation may cause serious complications in such uremic patients should not preclude full appraisal with the judicious use of the present day urologic armamentarium Renal insufficiency due to remediable types of obstruction may remain undiagnosed Cystoscopy will reveal obstructions in the lower urinary tract, obstructions in the upper part of the urinary tract will be detected by retrograde pyelography Campbell[2] lists the many causes of lower urinary tract obstruction which include contracture of the vesical outlet, spastic neuromuscular disease, congenital valves of the posterior urethra, hypertrophy of the verumontanum unassociated with valves, congenital urethral stricture, and congenital meatal stenosis

It is worth the effort to investigate the entire urinary tract in patients exhibiting renal insufficiency in whom there is even the slightest suspicion of error in the clinical diagnosis This is especially applicable in patients scheduled to meet the Physical Evaluation Boards when a definite percent of industrial disability may be determined

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There is an alarming increase in occurrence of cancer which is absolute, over and above all that is accounted for by better diagnosis and increasing older population Cancer of the lung has tripled in occurrence during the last several decades The biostatisticians calculate that if we all live to reach 125 years, each will be victim of some type of cancer

—GEORGE Z WILLIAMS M D
in Virginia Medical Monthly

DELAYED RUPTURE OF THE SPLEEN

Report of Three Cases

THOMAS A KIRK J L t t j g d MC USVR

LEWIS L HAYNES Comm d MC USV

RUPTURE of the spleen is one of the most common closed injuries of the abdomen being found by Mazel[1] in 30 percent of such injuries in 1932 and by Wright and Prigot in 47 6 percent in 1939 The latter believe that the actual as well as the relative incidence is increasing as a result of more frequent and more severe automobile and airplane accidents

Delayed rupture of the spleen, occurring in a 1 6 ratio with immediate rupture may be defined as one that becomes clinically evident 48 or more hours subsequent to the injury following a period of latency during which symptoms are minimal or even absent This latent period lasts less than one week in 52 to 60 percent or possibly 80 percent of the patients In 20 to 25 percent it lasts from 7 to 14 days and occasionally is longer The subject has been well reviewed by McIndoe Bueermann[7] and Zabinski and Harkins who collected 179 cases from the literature Since the latter report in 1943 frequent case reports have appeared in the literature

CASE REPORTS

Three cases seen at this hospital over a one year period are here presented Two of these are of special interest because of the latent periods of 20 and 31 days respectively

Case 1 A 24 year old man was admitted to this hospital on 14 June 1950 six days after a motorcycle accident He had felt well until the evening following the accident when he noted sudden chest and abdominal pain for which he was admitted to his base dispensary Examination there showed no abnormal findings except that the patient was unable to flex his body on the thighs because of abdominal pain The next day he felt better and remained asymptomatic for four days under observation At the end of this latent period the patient was suddenly seized with abdominal pain accompanied by profuse sweating pallor

F m U S N I H p l Por m h V L K k h May F unda
R h M C md Hay h U S N I H p l Ch l Ma

d weakness He had a weak, rapid, thready pulse of 96, and his ood pressure was 120/76 At that time he was transferred to is hospital

Examination showed an acutely ill, pallid, sweaty man un ble to sit up because of abdominal pain The abdomen was blinted and distended, and a sense of fullness in the left upper uadrant was noted, it was generally tender, especially in the ght upper quadrant, and peristalsis was increased A diagnosis f ruptured spleen was made and under spinal anesthesia, supplemented by endotracheal oxygen and ether, a celiotomy was erformed through a left paramedian incision When the peritoneal avity was opened, clotted and bright blood flowed into the ound The spleen, which had a large tear in the phrenic margin, as removed A total blood loss of 500 cc was estimated This as replaced during the operation The spleen weighed 295 grams nd measured 14 by 10½ by 5½ cm Multiple cross sections re vealed areas of hemorrhage within the parenchyma and sub capsular area and in the splenic parenchyma proper On the thirteenth postoperative day, 325 cc of sterile serosanguineous fluid was removed from the left chest The patient's course in the hospital otherwise was uneventful and he was sent to full duty on 30 July

This is a typical case of delayed splenic rupture appearing clinically six days following severe trauma to the left upper abdomen and chest The patient apparently had asymptomatic intrasplenic rupture 36 hours following injury, which subsided clinically on bed rest After an asymptomatic period for four days, he was stricken with typical sudden, sharp, abdominal pain accompanied by signs of shock

Case 6 A 21 year old man was admitted to this hospital on 8 February 1952, two days after an accident aboard his ship A tractor which he was driving overturned, crushing his chest and upper abdomen The patient became unconscious, cyanotic, and had emphysema and crepitation over the left seventh and eighth ribs anteriorly, with distant heart sounds After being given oxygen, plasma, and blood, he regained consciousness, and his vital signs appeared stabilized On admission, the examination showed a left pneumothorax with fracture of the left sixth, seventh, and eighth ribs, fracture of the left radius, and bilateral subconjunctival hemorrhages, suggestive of a superior vena cava syndrome Tenderness in the left upper abdominal quadrant was noted at this time An electrocardiographic tracing suggested coronary insufficiency The patient was given supportive treatment His electrocardiogram returned to normal, his lung re-expanded and the subcutaneous emphysema subsided

The patient progressed well until the twentieth day following injury when while receiving an enema he complained of pain in the left upper abdominal quadrant went rapidly into shock (blood pressure 84/48 and pulse, 130) and was noted to be pale and clammy Otherwise the examination was negative except for a distended rigid abdomen with tenderness Marked rebound tenderness was present in the left upper quadrant A diagnosis of ruptured spleen was made and the patient was given oxygen and 1 500 cc of blood under pressure Under spinal anesthesia a celiotomy was performed through a left rectus incision On opening the peritoneum 2 000 cc of old and fresh blood was encountered The spleen was found to be enlarged to about twice its normal size and a hemorrhagic area was noted in the upper pole through a tear in the capsule The spleen was removed and during closure of the abdomen the patient went into shock (blood pressure 50/0 pulse 180+) He responded to increasing the rate of intravenous blood flow so that on arrival on the ward his blood pressure was noted to be 120/60 but this immediately fell to 50/30 with an unattainable pulse and he died 15 minutes later

The pathologic report following autopsy stated that death was caused by myocardial failure, due to physiologic alterations incidental to the original injury—apparently of such magnitude as to preclude the tolerance of the intraperitoneal hemorrhage and excessive intravenous therapy necessary during the operative period The spleen weighed 290 grams The external surface contained two nodular masses and there was a laceration at one pole which extended into the parenchyma

The prolonged latent period of 20 days following extremely severe trauma to the abdomen and chest is of interest Throughout this period tenderness persisted in the left upper abdominal quadrant but was overshadowed and masked by other injuries

Case 3 A 14 year old boy was admitted to this hospital on 28 July 1952 Ten days previously the patient fell 45 feet from a tree and was knocked unconscious He was admitted to the neurosurgical service of another hospital where he had steady improvement of his conscious level but remained in a stupor with movement of the left extremities only and with sucking reflex and chewing movements of the lower jaw The patient was believed to have a severe brain stem lesion He was transferred to this hospital unchanged On examination his pupils were found to be active to light He had a paralysis of his right extremities except for some movement of the upper extremity on painful stimuli and there was spasticity of both lower extremities and bilateral positive Babinski's signs with increased deep reflexes and absent superficial reflexes His blood pressure was 140/80 pulse 70 and temperature 99 F rectally There

was overflow incontinence of urine All blood studies were normal, including a red blood cell count of 4 200,000 with hemoglobin, 93 percent On supportive therapy the patient improved slowly and on 3 August was taking food orally in small amounts, but with difficulty in chewing He seemed alert at this time and was able to respond to vocal stimulation by eye motions

On 16 August, 31 days following his injury, the patient was noted to be in pain, became suddenly pale, and was observed to have a distended abdomen He was given a soapsuds enema, after which the distention diminished and his vital signs remained stable An hour later the patient was again examined and was noted to have epigastric muscular rigidity, more marked on the right than on the left Bowel sounds at that time were normal On examination an hour later, bowel sounds had disappeared, the epigastrium was definitely rigid, and there was marked muscle spasm His hemoglobin at this time was 72 percent Surgical consultation was obtained and it was suggested that the patient had a perforated viscus, most likely a perforated Curling's ulcer in view of the head injury The abdomen was entered through a right paramedian incision On exposing the peritoneum it was blue and on entry 1,000 cc of old and fresh blood poured into the wound A large, partly organized clot was found in the left upper quadrant, the removal of which revealed active bleeding The spleen on removal was greatly enlarged, soft, and ruptured The patient received 1 000 cc of blood during the operation, tolerating it well Following this operation the patient improved slowly, and one month later was discharged to an outpatient status He was still hemiparetic but alert and progressively improved in his contact with surroundings He was able to utter monosyllabic replies to questions

The spleen measured 13 by 7½ by 4 cm and weighed 172 grams On the under surface there was a laceration 3¼ by 2 cm Several areas were irregular and appeared necrotic

This case report is significant not only because of the 31 day latent period, but because of the difficulty of diagnosis arising from the lack of subjective assistance with masking of signs by no current injury and absence of specific history of local trauma The ability of a patient so critically ill to withstand the additional shock of massive intraperitoneal hemorrhage and the trauma of splenectomy is remarkable

COMMENT

Patients with splenic rupture typically present a history of an injury to the upper abdomen or lower chest This is usually on the left side, although trauma to the right side may cause splenic rupture by *contracoup* effect Immediate symptoms vary

from those of a mild contusion to severe pain in the left upper abdominal quadrant which may be aggravated by respiratory motions and accompanied by weakness, faintness and sweatin *Subsequently the symptoms subside in 12 to 24 hours although the* patient may complain of soreness in the abdomen occasionally localized in the left upper quadrant An examination at this time may reveal a persistent rigidity of the left rectus muscle occasionally with deep tenderness an increase in splenic dullness costal breathing slight pallor, and weakness Faintn occasionally may occur Following a period of latency a fairly uniform picture presents itself with the abrupt onset of severe sharp left upper quadrant pain accompanied by pain in the left shoulder and shock Examination reveals a clammy pallid hypotensive patient with exquisite tenderness and spasm in the left upper quadrant A fluid wave is frequently demonstrable in the abdomen and shifting dullness may be present. A roentgenogram shows elevation of the left hemidiaphragm with tenting of its central portion

The most frequent conditions to be differentiated from delayed rupture of the spleen are perforated peptic ulcer and rupture of the liver kidney or appendix Rupture of other viscera may be confused with this condition as may that of an aortic aneurysm Perforation of a peptic ulcer is usually preceded by other symptoms of the disease and is in most cases associated with radiographic evidence of air beneath the diaphragm Rupture of the liver or left kidney may not be differentiable preoperatively All of these conditions require surgical treatment and differentiation finally rests on the operating surgeon

SUMMARY

Delayed rupture of the spleen is a relatively common condition following abdominal injury The nonoperative mortality of this disease approaches 100 percent the operative mortality is from 25 to 27 percent Prompt surgical intervention is the only treatment

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Roentgenographic Interpretation

The interpretation of chest roentgenograms like any other human activity is subject to considerable variation It has been demonstrated that competent and experienced physicians are likely to disagree with each other in a significant proportion of roentgenographic interpretations These inconsistencies were found when single roentgenograms were interpreted for the presence or absence of abnormal shadows Even greater discrepancies were demonstrated in attempts to classify single roentgenographic shadows according to character extent and probable activity of the lesion The implications of these findings to mass case-finding programs have been discussed in a number of publications

More recently inconsistencies of similar magnitude were found to exist in the interpretation of serial roentgenograms It was shown that in evaluating film pairs for evidence of progression regression or stability of disease well-qualified radiologists and phthisiologists disagreed significantly with each other Moreover a physician did not always agree with himself in two independent interpretations of a set of serial roentgenograms These findings are of great importance in clinical phthisiology in view of the universal employment of the procedure as an aid in the clinical management of tuberculosis patients

—J YERUSHALMY
in *Diseases of the Chest*

would not have permitted a satisfactory anastomosis an el liptical incision was made at the midportion of the kink A mucosa to-mucosa end to end anastomosis of the ureter was accomplished and a No 10 French polyethylene tube was u ed as a splint Drainage was established by means of a No 24 French Foley nephrostomy catheter which was brought out throu h



F gur 2 U ter py l g am two m ths aft ur t r l a ast m

the lower pole of the kidney with the polyethylene tube The wound was closed in layers around the drainage tubes

The patient s immediate postoperative course was good For the first month there was interrittent urinary drainage around the catheter and the tubing The nephrostomy catheter was irri

gated daily and the patient was given sulfisoxazole by mouth On the twenty-eighth postoperative day, the polyethylene splint was removed and the nephrostomy catheter was then clamped off for five days without pain or discomfort. Pyelograms made through the nephrostomy tube on the thirty third postoperative day revealed dye in the ureter and bladder There was no evi



F gure 3 Ur te opyelog am four months after ureteral anastomosis

dence of extravasation of dye at the site of anastomosis, but the ureter at this point was irregular and dilated The caliber of the anastomosed ureter appeared adequate The major calyces appeared to be less dilated than on preoperative films, however, the ureterectasis remained the same The nephrostomy tube was

removed on the thirty eighth postoperative day following which the patient developed minimal nausea and vomiting and a mild dull ache in the right flank for two days The patient was discharged on 28 January 1952 when a negative urine culture from the right kidney was obtained and no demonstrative changes in the pyelogram were noted (fig 2)

On 7 April a No 7 French ureteral catheter was passed easily to the pelvis of the right kidney without meeting any obstruction and 12 cc of residual urine was obtained Ureteropyelograms showed no appreciable change from films taken on 25 January The calyces and pelvis were slightly smaller than before the operation and the course of the ureter was more nearly normal Irregularity and dilatation at the site of anastomosis persisted (fig 3) even though the anastomosis appeared adequate and there was complete emptying of the dye on the 60-minute film The urine showed 5 to 10 pus cells per high power field but its culture was negative at the end of 48 hours The patient s general condition was good except that on rare occasions he had some minimal right flank discomfort for several minutes He was returned to duty but on 12 June while en route to a new station he was admitted to Brooke Army Hospital because during the previous four weeks he had had moderate pain in the right flank with frequent episodes of dark brown smoky urine Urinalysis on admission was alkaline and contained numerous pus cells The urine culture was positive for coliform bacteria On 14 June an intravenous pyelogram revealed dilated calyces and pelvis with poor drainage on the right side and a 1 5 by 2 cm opaque density in the vicinity of the right ureteropelvic junction A right ureteropyelogram confirmed the presence of a calculus in the kidney pelvis and the possibility of a stricture of the upper ureter A right pyelolithotomy was performed and the calculus removed The patient s postoperative course was satisfactory for four weeks when an unsuccessful attempt to remove the pyelostomy tube made surgical intervention necessary because of calcification around and in the lumen of the tube On 20 July a retrograde pyelogram revealed complete drainage in 150 minutes

After returning from convalescent leave on 5 September, the patient was in good health and had no complaints His urine was clear and cultures were negative Intravenous pyelograms showed marked improvement in the caliectasis and ureterectasis There was no evidence of urinary calculi A personal letter from the patient received in October 1952 indicated continued improvement

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PITUITARY EOSINOPHILIC ADENOMA

Report of a Case With Multiple Complications

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THIS report is not intended to contribute new diagnostic or therapeutic concepts to the literature, but to present a patient whose hospital course included intriguing and challenging complications which required vigorous management We believe a narrative summary of the case may prove interesting

A 21 year old man, who had sustained a trivial blow to the frontal region from an overhead pipe, was admitted in June 1951 complaining of headache, vomiting, and photophobia of less than six hours' duration The ship's medical officer noticed that his left pupil was larger than the right and recorded a pulse rate of 40

The patient had been in good health prior to his present illness He admitted rapid growth since 16 years of age, when he was of normal stature to a height of 6 ft 6 in and he weighed 235 lb He was an alert co-operative patient with large feet pale hands, and prognathism consistent with hypophyseal gigantism (fig 1) External genitalia and hair distribution were not unusual His temperature was 98 6 F pulse 48 respiration, 16, and blood pressure 124/80 Neurologic examination revealed a partial third cranial nerve paralysis on the left and dilation of the left pupil, with normal reaction to light Diplopia on extreme left lateral gaze, and severe photophobia were elicited Initial laboratory studies were within normal limits A lumbar puncture indicated an initial pressure of 160 mm with a final pressure of 140 mm following withdrawal of 8 cc of crystal clear fluid The protein was elevated to 95 mg per 100 cc

Within 24 hours the patient became increasingly lethargic to the point of stupor His temperature rose to 102 F and he had a three plus nuchal rigidity with positive Kernig's and Brudzinski's signs His tendon reflexes were generally hypotonic The corneal

From the U S Naval Hospital Portsmouth Va

reflexes were diminished with less response on the left Complete paralysis of the third fourth and sixth left cranial nerves and the sixth nerve on the right with a partial paralysis of the right third were demonstrated Disk margins were hazy without papilledema A second lumbar puncture showed an initial pres



Fig 1 Mixed gross facial myokymia and guttate pustular rash on the left thigh and lateral aspect of the left leg

sure of 280 mm and yielded yellow brown fluid containing 675 erythocytes and 876 leukocytes of which 744 were polymorphoneucleocytes and 132 were lymphocytes The total protein was 250 mg per 100 cc Stereoscopic roentgenograms of the skull revealed marked enlargement of the sella turcica and erosion of the clinoids and posterior three quarters of the floor with probable continuity with the sphenoid sinus (fig 2) The right maxillary and ethmoid sinuses were opaque with mucoperiosteal thickening of the left antrum After obtaining blood and spinal fluid cultures we started intravenous sodium sulfadiazine and intramuscular aqueous and procaine penicillin therapy in large doses

No growth was obtained from a blood culture, but the spinal-fluid culture revealed hemolytic *Staphylococcus aureus*

Subjected to a fulminating meningitis, the patient s condition rapidly declined, and 48 hours after admission his temperature reached a peak of 104 8 F with transient Cheyne-Stokes respiration lasting 1 hour By the fifth hospital day, his fever had



F gure 2 Roentgenogram of ballooned sella turcica w th erosion of ts floor prio to adiation.

decreased to 100 4 F and his deep coma was lightened by periods of confusion, disorientation, and restlessness Frank bilateral papilledema was present, but the other neurologic findings remained unchanged A third lumbar puncture rendered 3 cc of fluid with a final pressure of 444 mm A spinal fluid cell count showed 120 erythrocytes and 705 leukocytes with a preponderance of polymorphonucleocytes The total protein was 135 mg per 100 cc Succeeding days brought cyclic changes in his mental state alternating between alertness and confusion His speech was thick and slurred His pupils became round and symmetrical and reacted to light By the tenth hospital day his temperature was normal and he resumed an alert, well oriented attitude with only minimal nuchal rigidity His capricious cranial nerve paralysis became limited to the third and sixth on the left and the sixth on the right Evaluation of his visual fields showed bi

lateral peripheral constrictions and enlargement of the blind spot on the right

The patient s recovery from meningitis appeared complete by the third week but the involvement of his extraocular muscles and peripheral vision persisted In the absence of papilledema at this time roentgen therapy directed toward the pituitary fossa was cautiously started Employing three ports of 48 sq cm each to the frontal and temporal areas a calculated tumor dose of 2 799 r was administered in 30 days Dramamine and intravenous fluids adequately controlled intermittent radiation sickness for two weeks during the treatment Daily funduscopic visual acuity and field examinations during this period showed no adverse reaction to therapy On completion of the course his visual field and acuity were normal and only a slight weakness on right lateral gaze remained Five days after concluding this treatment cerebrospinal rhinorrhea developed and continued for four days Prophylactic antibiotics were continued until its cessation was assured Spinal fluid obtained by lumbar puncture was normal except for elevation of the protein to 95 mg per 100 cc The patient continued to do well except for a persistent low grade anemia and his failure to regain 75 lb of weight lost since admission

Complaints of intermittent abdominal cramps nausea vomiting and weakness preceded another acute onset of lethargy and semistupor with a precipitous fall of blood pressure from 110/60 to 70/40 Previous insidious development of lemon yellow skin thickening of the tongue decrease of libido and tawny pigmentation at the buccal angles and lumbar region were prodromal symptoms of hypopituitarism and adrenal insufficiency Confirmatory blood chemistry studies adrenalin and ACTH Thorne tests were obtained and the patient was immediately given intravenous saline and 35 mg of ACTH intramuscularly every six hours Dramatic clinical improvement followed in 48 hours Laboratory studies indicated the presence of viable adrenal cortex with insufficiency secondary to panhypopituitarism Because his basal metabolic rate ranged consistently from minus 35 and to minus 45 he was given 0 3 gram of thyroid extract daily with mineral supplements of calcium potassium and iron Despite adequate medication directed toward the endocrine dysfunction anemia two blood transfusions were required these resulted in marked clinical improvement Gradually the medication was decreased to minimal maintenance doses of 5 mg of ACTH q i d and 0 25 gram of thyroid extract daily This was accomplished with the guidance of exhaustive periodic laboratory studies including basal metabolic rates glucose tolerance and blood chemistry tests and circulating eosinophil counts From the low level of the basal metabolic rate we believed that hypothyroidism was

the dominating feature of his hypopituitarism Other laboratory determinations and vital signs remained normal

By March 1952 all medication except thyroid extract, vitamins, and minerals was discontinued Roentgenograms of the skull at this time showed evidence of recalcification of the clinoids and pituitary fossa The patient regained his strength and weight (to 207 lb) on this regimen

During exceptionally hot weather in June 1952 he again developed signs and symptoms of adrenal insufficiency, manifested by weakness, malaise, and gastrointestinal complaints The condition was evidently precipitated by salt depletion, but responded rapidly to ACTH and intravenous saline Of particular interest was his cheerful and co-operative attitude despite a long illness and intensive study Patients afflicted with eosinophilic adenoma are considered prone to exhibit irritable natures

Upon the termination of his hospitalization in July 1952, this patient was improving steadily without adrenotrophic or replacement therapy except thyroid A constant vigil for signs of insufficiency must be maintained throughout his life A letter from him in May 1953 revealed that he was feeling well and had received no medication of any kind for six months He weighed 203 lb and is an outpatient at the Veterans Administration Hospital near his home

SUMMARY

The spontaneous complications of an eosinophilic adenoma of the pituitary gland and disturbances following radiation therapy are reported in a patient, admitted because of an apparent head injury, who developed an acute fulminating meningitis secondary to erosion of the sella turcica by a pituitary adenoma The appearance of panhypopituitarism and acute adrenal insufficiency required prompt management and prolonged substitution therapy

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While we would not say that urban air pollution is responsible for the increased incidence of lung cancer it does seem to be *one* significant factor in this increase Any factor associated with a doubling of the lung cancer rate is certainly significant especially when its doubling can scarcely be linked to housing nutritional state socio economic status or any other environmental factor except irritants in the air breathed

—C A MILLS M D
in the *American Journal of the Medical Science*

FAMILIAL SCAPHOCEPHALY IN FATHER AND SON

JAMES W MURPHY *Capt* *USAF (MC)*

SCAPHOCEPHALY is one of the rarer forms of craniostenosis and occurs as a result of premature synostosis of the sagittal suture of the skull Unable to grow laterally, the skull assumes an elongated form which has been described as boat-shaped or football shaped Its cause is unknown Greene has shown in rabbit breeding experiments that premature synostosis of the cranial bone is hereditary Very few hereditary cases have been reported in man [1] Greig in discussing oxycephaly stated that as a congenital defect heredity ought to occur but examples are restricted since those but slightly affected do not seek medical advice and those grossly affected are not acceptable in marriage Most scaphocephalics are sporadic isolated cases The prognosis is usually guarded because of the high incidence of associated hydrocephalus mental deficiency and blindness resulting from pressure upon the optic nerves [2]

This report describes two cases of scaphocephaly in one family involving the father and his infant son

CASE REPORTS

Case 1 A 2½ month old white male infant was admitted to this hospital on 15 October 1952 Scaphocephaly and hydrocephalus had been noted in the outpatient clinic where he had been brought because of an upper respiratory infection The patient was born 21 July 1952 at this hospital by spontaneous delivery following a normal pregnancy of nine months His birth weight was 7 lb 1½ oz His mother was a 20 year old primipara and in good health The infant s neonatal course and routine examination one month later were normal The gradual elongation and enlargement of the head was unnoticed by the parents For a month his cry was high pitched but he had seemed content and healthy

The patient was a well nourished infant with an enlarged narrow and elongated head Prominent frontal bossing was present and the sutures of the skull were separated The posterior fontanelle was open and the anterior fontanelle was en

F m U S Air F H p tal L gl y Air F B V

larged and bulging A raised bony ridge represented the closed sagittal suture The veins of the scalp were distended and the eyes bulged forward and downward Macewen's sign was elicited upon tapping the head Head and chest measurements are given in table 1

TABLE 1 *Head and chest measurements of infant case 1*

Age (months)	Head circumference (cm)	Chest circumference (cm)	Head occipitofrontal diameter (cm)	Head biparietal diameter (cm.)	Anterior fontanelle (cm)
2½	41 6	39 5	17 9	10 2	9x4
4	45 2	41 4	17 2	10 8	8 1x4
5½	47 1	45 2	17 9	10 8	7x4
7	47 1	46	18 5	11 5	7x4
8	47 8	46	18 5	11 5	6 8 4
9½	48 5	45 5	18 5	11 5	6 5x4

Roentgenograms of the skull demonstrated increased intracranial pressure Those of the lumbosacral spine did not reveal evidence of spina bifida occulta A lumbar puncture produced an initially clear, slowly dripping fluid, which was sterile The subdural taps were traumatic because of the distended network of scalp veins Five cubic centimeters of spinal fluid was removed from each subdural space which was clear after centrifugation

A consultation was obtained at Walter Reed Army Hospital where the diagnosis was confirmed and conservative treatment advised rather than an immediate operation The infant remained healthy except for occasional mild respiratory infections He received routine immunizations and developed normally He smiled at two months of age and at three months his eyes focused very well At five months he was bright, inquisitive, could grasp with his hands and roll over, and was teething He could sit at seven months and crawled two weeks later At nine months of age he was active (fig 1), had good vision and reached out with either hand The eyes still bulged and his head configuration was the same, but the scalp veins were no longer as prominent and the anterior fontanelle did not bulge

Case 2 The father of the infant described above is 27 years old, and was one of five children His parents grandparents and siblings were all normal but his photograph at six months of age showed typical scaphocephaly His grandfather, a physician, was said to be greatly concerned about his head size in the first months of infancy He advanced normally in school and com

pleted the eleventh grade His scoring on an Air Force aptitude test was average, or above in all proficiency fields His eye sight was excellent and he was efficient and energetic in the performance of his duties The patient s head shape is still moderately scaphocephalic (fig 2) but the size is only slightly enlarged in proportion to his body size



Figure 1 Photograph of mother, father and children with long narrow heads

DISCUSSION

These observations of two patients with scaphocephaly in one family represent a rarity in the medical literature They differ from most reported instances of scaphocephaly because they have developed satisfactorily without treatment despite early symptoms of hydrocephalus and increased intracranial pressure Although Duguid s four sibling patients were backward with I Q s of from 68 to 90 the prognosis may be better in familial rather than in isolated instances Many authors warn that early treatment is mandatory with parasagittal craniectomy or decompression operation preferably before three months of age In evaluating such a patient for possible operation it may be helpful to determine whether one is dealing with a familial or an isolated occurrence A thorough family history

including an actual examination of all available blood relatives, should be done As in the case of the infant patient the discovery of childhood pictures of the father aided in establishing the familial aspect of the condition.

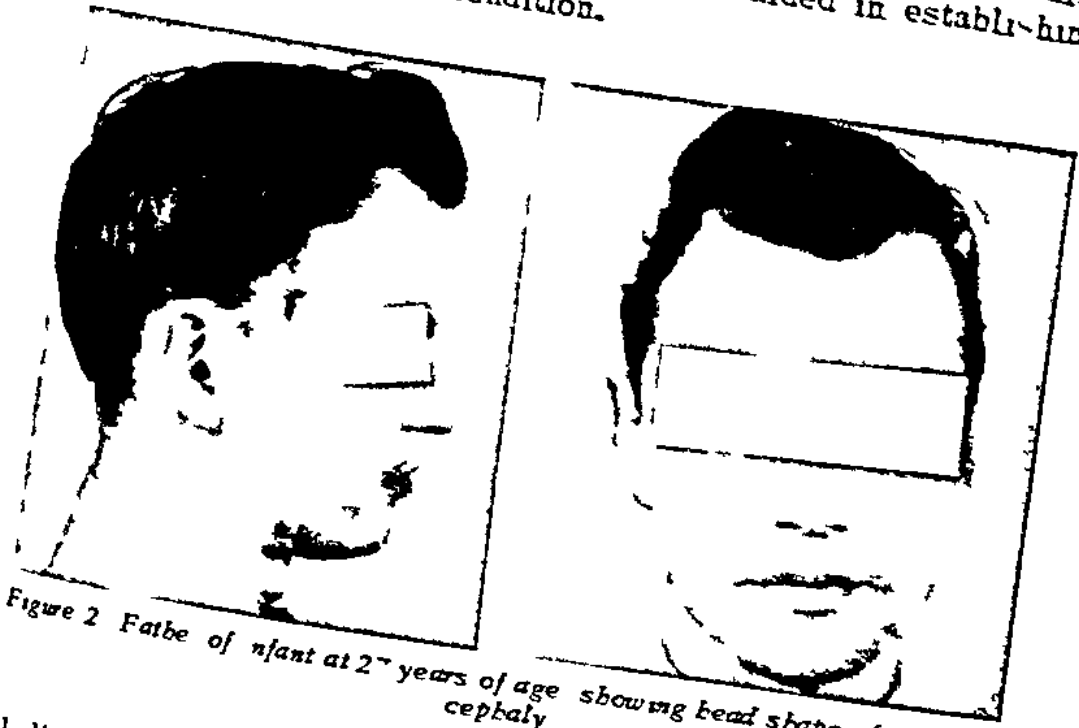


Figure 2 Father of infant at 2 years of age showing head shape of scaphocephaly

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PROLAPSE OF THE UTERUS WITH SPINA BIFIDA IN THE NEWBORN

CLARENCE F WEBB *First Lieutenant USAF (MC)*

NATHANIEL R WHITNEY *Captain USAF (MC)*

THE association of prolapse of the uterus with spina bifida in newborn infants, although not unknown, is uncommon Noyes[1] found 24 cases in a complete review of the literature and added 1 of his own Subsequent isolated occurrences have been reported Torpin[2] described 2 patients seen in the same institution Because of the infrequency of this association, we are here reporting an additional case

CASE REPORT

The patient was born spontaneously on 21 November 1952, although the estimated date of delivery was 7 October The mother was a primipara and her pregnancy had been uneventful except for what was described as a virus infection which occurred during the third month of gestation This diagnosis could not be confirmed The infant weighed 3,045 grams at birth, and presented a large spina bifida with a meningocele in the lumbar region At its base the meningocele measured 6 by 4 cm , and it projected 4 cm above the skin surface Talipes equinovarus was present bilaterally, but was more pronounced on the left No other abnormalities were noted at birth

On 24 November 1952 a mass, identified as the cervix and the lower portion of the fundus of the uterus, was observed protruding from the vagina The uterus was replaced manually, but it prolapsed recurrently whenever the infant cried or strained Straining also produced loss of urine

The patient took feedings poorly, and progressively lost weight The meningocele continually drained fluid On 12 December 1952 she developed pneumonia and died 2 days later At the time of death she weighed 2 370 grams Permission to perform an autopsy was not obtained

DISCUSSION

Early surgical repair of meningocele associated with spina bifida recently has been advocated The possibility of prolapse of the uterus and of urinary complications, however, should be

From U S Air Force Hospital R b A F Ba Ga

kept in mind when surgery is contemplated Prolapse usually occurs during the first week of neonatal life Ebeler and Duncker von Graff and Laws all have discussed the occurrence of uterine prolapse in nulliparous adults with spina bifida

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Hypertension

Men sustain corona y occlusion much more freq ently than women nd at a e rl er ge The frequency of hypertension in the men studied averaged 27 2 percent and increa ed only slightly if at all w th age More than 70 percent had had a normal blood pressure before the nset of the co on ry occlusion! Hypertension therefore is not the all m po tant fa tor in the causat on of coronary occlusi n in me This conc l s o differs fr m th t f any repo ted tudies on the relat onship of inc eased blood pressure to the onset of coron ry occlusion

Sev nty one percent f the women had had hypertension preceding the attack In wom n who sustain coronary occlusion therefore hyper tens on is a very significant etiologic factor

Th results of a r cent postmortem study confirmed our cl nical find gs hype tension d d not appear to be a f ctor in producing coronary dise se nd occl s on among me b t was def n te factor in its causat on mo g w men

—ARTHUR M MASTER M D
in C *culation*

GENERALIZED VACCINIA IN THE PRESENCE OF DIFFUSE DERMATITIS

ROBERT J HALL *Captain MC USA*

COMPLICATIONS of properly performed vaccinations for smallpox are rare They include local pyogenic infection, tetanus, postvaccinal encephalitis, and generalized vaccinia[1,2] Thirty six cases of generalized vaccinia were reported in over six million vaccinations during the small outbreak of smallpox in New York City in 1947[3] Although the terminology suggests hematogenous dissemination, the influence of concomitant skin diseases would seem to indicate that autoinoculation plays a more important role in the pathogenesis[4] of generalized vaccinia

CASE REPORT

A 21 year old man who had never been immunized for smallpox prior to entering the service, was vaccinated on 30 August 1952 with no "take" In early December he noted the onset of a pruritic oozing eruption in the left axilla, which by January had spread to the groin, perineum, neck, and face The involved skin was red, scaly, and pruritic, with weeping in the intertriginous areas He noted dandruff for the first time He was revaccinated at a replacement depot in Japan on 7 February 1953, in spite of the dermatitis His rash became rapidly worse and the pruritus increased He was examined at his unit dispensary on 13 February and treated with penicillin The following day he complained of malaise, headache, and chilliness His headache became more severe and a red papular rash developed on his face He was admitted to a dispensary on 15 February with a temperature of 104 F His vaccination at this time was pustular, surrounded by a large area of erythema and edema, and beginning to form a superficial crust His elevation in temperature persisted and he was transferred to this hospital on 19 February 1953

On admission he was acutely ill with a rectal temperature of 104 F and pulse rate of 140 Innumerable pustular encrusted lesions discrete and confluent, were present over his face, eyelids, neck, axillas groins genitalia and popliteal areas Massive edema of his face (fig 1) prevented opening the eyes both auditory canals were draining and the right was edematous and oc

From U S Army Hospital Camp Stoneman Calif

cluded The lesions in the intertriginous skin folds were macerated and weeping The corneas were not involved The primary vaccination on the left arm was covered with a large eschar A diagnosis of generalized vaccinia was made



Figure 1 Member of the fair gilded a.

On admission the leukocyte count was 14 600 with 82 percent polymorphonuclears Prophylactic antibiotic therapy was instituted The temperature ranged between 102 and 105 F for the first two hospital days and a low grade fever persisted through the eighth day A diffuse morbilliform rash appeared on the third day and rapidly faded during the next two days The cutaneous lesions were exposed to the air to facilitate drying By the fifth hospital day the edema had almost completely subsided and crusting of the lesions started Improvement continued and al

most complete clearing occurred by the twenty f rst hospital dav Minimal scarring resulted The underlying seborrheic dermatitis remained in evidence after complete clearing of the vaccinia (fi 9)



Figu e 2 F e ueeks late pat ent bad m nimal sca ing of face

DISCUSSION

The antecedent dermatitis played an important role in the dis :minated vaccinia observed in this patient, and the pruritic ıture of the rash makes autoinoculation most plausible Vaccina ons should not be performed in children with eczema, but, be ıuse of its infrequency little thought is given to the possi .lity of generalized vaccinia occurring in the military age group rior vaccination of nearly all adults almost eliminates this

problem Routine primary vaccination should not be performed on persons with active skin conditions but revaccination is relatively safe The absence of immunity from previous vaccination and the concomitant dermatitis in the patient reported appeared to be related to the occurrence severity and distribution of the generalized vaccinia Because of the possibility of scarrin from generalized vaccinia, an appreciation of this complication is important

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Wars and Old Books

It has long been known that major wars in Europe tend to stimulate the antiquarian book trade and to move masses of old books and manuscripts to new locations They are not actually shot from guns out of one country into another but the result is almost the same as if they had been War causes poverty and distress and after a war many families having rare and valuable books bring them out and offer them for sale in order to obtain the necessities of life After the Napoleonic Wars rare books and manuscripts moved in quantities from the European continent to England and thus the foundations were laid for many of the great British collections notably that of Sir Thomas Phillipps who has been called the greatest collector of manuscript matter the world has ever known After the first World War the migration was from the European countries including England to America Some of the most notable American collections were greatly expanded at that time

—F m Arm d Forc s M d l Libr y *New*

SUPERNUMERARY INTRATHORACIC RIB

A Case Report

WILLIAM M MARBUT *Lieutenant Colonel MC USA*

WILLIAM L DeGINDER *First Lieutenant MC USA*

THIS report of a patient with a supernumerary intrathoracic rib is of interest because we have not found a description of this particular type of anomaly in the literature

A 90-year old woman was seen in the outpatient clinic because of repeated episodes of severe aching pain beneath the right scapula and a sharp stabbing pain of 24 hours duration which was related to respiratory motions and coughing Physical examination was negative A routine roentgenogram of the chest was essentially normal except for a heavy vascular shadow descending from lower pole of the right hilum (fig 1) The patient was treated with acetylsalicylic acid and local heat applications but she returned in 1 week with the same complaint Anteroposterior and lateral roentgenograms of the thorax were made and an anomalous intrathoracic rib was evident at once (figs 2 and 3) The possibility of calcified empyema was excluded by the history and by the fact that the right lung field appeared completely normal except for this anomalous structure

Certain features of the past history are of interest. The patient fell from a log when she was a child and injured her upper thoracic spine No roentgenograms were made but she was kept in bed for 3 days She had had intermittent aching and stabbing pains in the upper thoracic spine and right subscapular area since that time, and believed that these pains were due to the injury received in the fall Unusual activity or exertion was often followed by pain, and sitting for a long interval might also start it Only once before had there been any particular relationship between the pain and respiratory motions In 1950, she was hospitalized for severe sharp stabbing pain related to coughing or deep respiration She was treated for pleurisy and although several roentgenograms were made she was sent home in 5 days with the assurance that there was nothing wrong with her chest

From U S Army Hospital Camp Roberts Calif Lt Col Marbut now 110th Station Hospital U S Army



F g 1 R t po teroa t or tge g m f best

or spine She had had roentgenographic examination on at least 3 occasions prior to that hospitalization

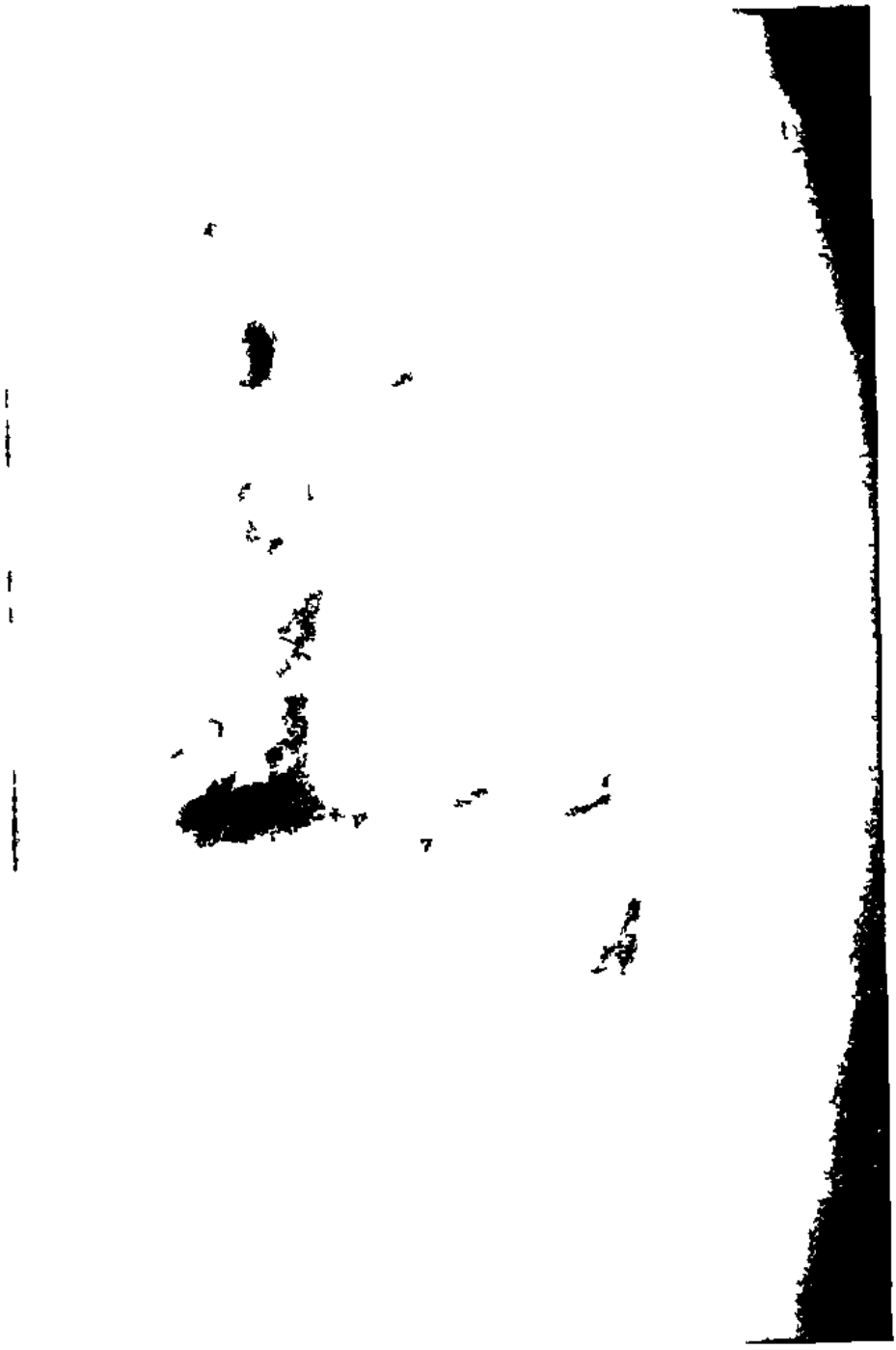
DISCUSSION

The roentgenograms made with standard technic for lung detail did not reveal the nature of the heavy shadow that extended from the lower pole of the right hilum to the diaphragm It was precisely superimposed upon the vascular pattern and appeared to



F gur R x m at w th h gher p k k lov It g

branch at its lower extremity Posteroanterior and lateral projections made for detail of the thoracic spine showed a complete and well formed rib articulating with the right anterior margins of the sixth and seventh thoracic vertebral bodies at the interspace Normal rib articulations were visible behind it, and there were 12 normal ribs on each side The lateral view showed the supernumerary rib well within the posterior thoracic wall, surrounded by normal lung An attempt was made to have the patient return for additional examinations, but she had moved from



F g r 3 Lateral project on shou ng the t athoracic pos t on of the upe n metary b

this region From a study of the roentgenograms we believe that the anomalous rib lay completely enfolded within the lung in a reflection of parietal and visceral pleura in much the same way that the azygos vein is embedded in the apex of the lung to produce the anomalous azygos lobe The parietal pleura around this rib was sensitive to pain and subject to friction The unusual stresses imposed upon this fold of pleura could predispose it to inflammation, and the aching pain in the region of the sixth and seventh thoracic vertebras which constituted the patient s major complaint may be explained on this basis

This intrathoracic rib had been overlooked by several physicians and at least 3 radiologists in the standard posteroanterior roentgenograms of the chest Others have probably been missed in a similar manner It is not possible to take stereoscopic or routine lateral roentgenograms on all patients in large institutions but one can usually be certain whether or not there is something peculiar or abnormal in the routine posteroanterior view The reliability of this single view as a survey procedure is generally accepted but only by re examination and special positioning is it possible to identify the various abnormalities that may be suspected through examination of the routine posteroanterior roentgenogram of the thorax

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THE SIX COMMANDMENTS OF BIOPSY

Biopsy all suspicious growths unless there are definite contraindications

Investigate a thorough search for a possible primary before incising a suspicious lymph node

Obtain adequate representative tissue without crushing shredding or burning the specimen

Prepare and fix the tissue in formalin and promptly submit for pathologic examination

Supply pertinent clinical history to the pathologist including age sex and prior therapy

You must never accept a negative report as final if suspicion still exists

—from the *Cancer Bulletin*

EOSINOPHILIC GRANULOMA OF BONE

RICHARD G LESTER *Captain, USAF (MC) (1)*

WHEN an isolated bone tumor with an area of circumscribed rarefaction is discovered during roentgen studies, eosinophilic granuloma should be considered in the differential diagnosis This tumor has been defined as "a granulomatous proliferation of the reticulum cells" *(2)* It is usually considered to be related to Hand-Schuller Christian and Letterer Siwe dis e es but is not of the same series as the lipoid reticuloses, such as Gaucher s disease Eosinophilic granuloma, as well as the other more severe forms of granuloma, may well represent a peculiar inflammatory reaction to some as yet unknown infectious agent" *(3)*

Although lesions which were probably eosinophilic granuloma were reported as early as 1929, it was not until 1940 that Otani and Ehrlich *(4)* and 2 months later Lichtenstein and Jaffe *(5)* reported the first recognized cases (The former group termed the growth a solitary granuloma of bone," whereas Lichtenstein and Jaffe used the term now generally accepted) Many cases have been presented since then *(6 11)*

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(1) 6110 H pital Group t tum of wr ting now at Stanf d Uni er ty H p tals San Francis o Cal f

(2) P sh D G R g olog diag s f d s s f b es In Gold n R (d t) Diagn tic R g l gy W lli m & W lk Co B l m e Md 1 l II p 475

(3) J ff H L nd L ht nste L E t philic granul ma of b e cond t n f cting ne se eral or many bo es but app ntly l m ted to kel t n nd r p e- ting mald t linic l xpre n f p cul nfl mm t ty hi ti cyt si also under- lying Lett r-S w d s a d Schuller-Chr tian di s Ar h P th 37 99-118 F b. 1944

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Typically the tumor is solitary and may be found in any bone It seems to have a predilection for the ribs skull and ilium Multiple granulomas having the appearance of eosinophilic granuloma have been reported in several bones in the same patient and in addition visceral tumors have been reported Pu h (points out that growths may be discovered later in other parts of the body after an apparently isolated tumor has been identified In many patients no symptoms referable to the tumor can be elicited Slight pain and tenderness may occur over the site of the lesion and a slight elevation of temperature and in some cases leukocytosis and/or eosinophilia may be present Especially in cases where a rib is involved a fracture across the involved area may be incurred and symptoms may date from the time of mild trauma

Roentgenograms show an area of well demarcated radiolucency within the medulla of the affected bone Usually no reaction about the lesion is seen In rib tumors the lesion may be somewhat expansile and in those patients in whom a fracture occurs across its site some local reaction can at times be seen (3) Grossly the specimen is usually soft and friable Under the microscope the most outstanding feature is large collections of eosinophilic leukocytes, and in Lichtenstein and Jaffe s words the presence of compacted tumorlike aggregates of large phagocytic cells with conspicuous collections of eosinophilic leukocytes interspersed (5) As they point out (3) the basic cells of the tumor are histiocytes and the eosinophils are its imprint Other demonstrable cell types include leukocytes multinucleated giant cells lymphocytes and products of destruction and repair Foam cells may also be seen especially in old lesions, and are similar to those in Hand Schuller Christian disease A number of observers have pointed out the similarities in the microscopic picture of this disease with Hand Schuller Christian and Letterer Siwe disease (1)

Treatment of eosinophilic granuloma may be either wide excision of the lesion or the use of radiation A biopsy should be performed in all instances except when there is no doubt as to the diagnosis If radiation is used Baker and Fisher (6) recommend that curettage not be performed at the time of biopsy because bony proliferation will occur more readily from a spicular matrix

CASE REPORT

A 35 year old man was admitted to the hospital because of dull pain in the region of the right posterior lower rib cage o

(11) Ca 38372 E ph l gr l ma f b (Ca R d f th M h m G ral Hosp l) N w E gl d J M d 247 410-413 S pt 11 1952

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1 mo th's duration The pain had begun abruptly following a jeep accident, but was not so severe that he sought medical attention immediately During the interim there had been a 10-pound loss of wei ht but no other symptoms Physical examination revealed an area of tenderness over the right eleventh rib, posteriorly, in the mid capular line with a definite irregularity along its superior border No other physical signs were elicited Roentgenograms of



F gure 1 Roen genog am shown osteolys s the ght eleventh b

the thorax showed an area of osteolysis in the right eleventh rib with ragged borders and with interruption of the cortex superiorly (fig 1) An extensive roentgenographic bone survey did not reveal any other significant lesions Blood studies and a sternal marrow biopsy were within normal limits The lesion was removed surgically Gross examination showed a hard gritty gray tan mass surrounded by bony tissue except in 1 area where it had almost entirely replaced the bone On section the mass was light gray firm and homogeneous Microscopic examination showed the typical picture of eosinophilic granuloma

THE RELATION OF PHYSICIAN AND PHYSICAL THERAPIST

ROBERT W AUGUSTINE L t t C l l USAF (MC)

THE practice of medicine has become a complicated undertaking The extensive ramifications of the healing art have passed beyond the mastery of any one person Technically trained workers can be of great assistance to the physician Intelligent patient care is rendered by many people of various stations and their limitations are defined only by their innate abilities and ethical applications in their special field of training These associates have become invaluable in the care of the patient

The final decision in medical matters must be made by one person Such decisions are best made by the physician because of the greater insight he has gained from training and practice This insight enables him to co-ordinate the efforts of the auxiliary medical services to provide the best care for the patient with efficiency and minimum effort Perhaps the greatest pitfall for members of the medical auxiliaries such as physical therapists is for them to practice their profession without acquiring the insight that separates the practical actions from the superfluous the disease assuming patient from the ill the time honored sterotyped modality from the effective method, and remunerative practice from the needed treatment

CLOSE LIAISON NECESSARY

There must be close liaison between the physician and his auxiliary specialists This communal relationship should be sponsored by both parties and must not be obstructed by the common attitude that the physician is superior in all things of a medical nature Leadership by the doctor of medicine is necessary to guide technical medical assistants and should include a full explanation of the subject and a practical demonstration when indicated The authority of the physician should be exercised in a constructive form so that those under his supervision increase their knowledge of the medical sciences, and improve their capabilities of service to the patient The physician's authority should not be used to insure subordination or prevent his assistants from gaining clinical knowledge that will aid them

F m U S Air F H p I M w ll A F B Ala

in their duties He must be a teacher and impart to his trained medical assistants scientific and critical methods of approach to clinical procedures

Within any auxiliary medical specialty, such as physical therapy, one must develop and practice those methods which produce evidence of improvement in the patients, favorable follow up studies, and the approval of others in the same field of medicine This does not preclude independent thinking and constructive changes, but eliminates the projection of the medical subspecialty beyond its reasonable limits The physical therapist, like all other medical auxiliaries, must have the desire to increase her knowledge and capabilities or else she will become perfunctory and unenlightened in the performance of her duties

REDUCTION OF INEFFECTIVENESS

The object of medical care in the Armed Forces is to conserve our fighting strength The attitude of the medical profession and its allied sciences must be dynamic in promptly returning the patient to active duty A portion of our service personnel, as of the general population, are persons who readily assume a dependency reaction fostering invalidism, with unusual self centered concern for their well being and an attitude of noneffectiveness Even aggressive individuals may succumb to the attraction of the patient status and its freedom of responsibility Their burdens are transferred to others in an unreasonable proportion

Perhaps the greatest transgression of both the physician and his auxiliary assistant is the assumption of diagnoses not based upon sound pathologic and physiologic concepts The treatment of the patient who does not have an accurate diagnosis may prove to be psychologically dangerous Physical therapy applied as a nonspecific therapeutic measure is apt to yield mediocre results Once treatment is begun, both the doctor and patient concur in the presence of disease and hence of disability Failure of the patient to improve or ultimately be cured may become embarrassing and inexplicable Resolution of every doubt concerning a patient particularly when there is no evidence of disability, is not necessary it is usually time consuming and frequently impossible In the military service the patient must be judged on the objective clinical findings rather than on purely subjective complaints There is no reason in the service to meet a subjective complaint, which is unsupported by demonstrable objective findings or a detectable organic cause, by prescribing a physical therapy thermal treatment the "laying on of hands" or by excusing the patient from duty The laying on of hands" by the physical therapist in such cases may not result in the patient s improvement

Our civilization assumes that one can accept realism without undue disintegration of his character and spirit The patient with a chronic disease in whom improvement cannot be expected should be told rather than be given long continued nonbenefi cial physical therapy Phy ical therapeutic modalities such as heat diathermy and the personal service of massage in chronic diseases must be viewed critically both as to the need for such treatment and to the beneficial effects to be derived therefrom

The military physical therapist will find that active measures of treatment correspond to the military mission and the average young age of the patient Active exercises and conditioning will do the most for the patient who is convalescing from an injury or or operation and will prove successful for many chronic condi tions presently treated with heat massage or diathermy The physical therapist and the physician must remember that some conditions such as limited joint motion will improve slowly by natural forces and little is gained by physical therapy

SUMMARY

Physical therapy is an auxiliary to the art and practice of medicine and should be practiced under a physician s super vision particularly when it is the major treatment given the pa tient The diagnosis must be confirmed before treatment is started with physical therapy The measures applied must be realistic and of dynamic character and the patient s progress should be followed by the physician and physical therapist The physician physical therapist relationship is one of mutual exchange of thought and leads to mutual comprehension of the therapeutic goal and the therapeutic measures necessary for its attainment

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It ha been only w thin the past few years that statist cs ndicate a signific nt advance in the survival rate of patients with gastric car cinoma A surgery has advanced undoubt dly many cases previously con id red inoperable have responded more succe sfully to rad cal surgery Howe er the over-all survival rate in unselected p tients is still no greater than 10 percent t most A cure of cancer of th stomach is achieved very inf equ ntly

—W ROSS MORRIS M D
in the *Am can J urnal of Surge y*

ASSORTED USES FOR PLASTIC TEETH

FRANCIS W SHAFFER *Major DC USA*

SINCE the advent of acrylic (plastic) teeth many uses have been made of them which increased their versatility Such teeth are not only used in full and partial denture prostheses, but also in crown and bridge prostheses Because the material is easily shaped and worked with minimal effort, it has been a boon to dentists and dental laboratories everywhere Some of the major uses for acrylic teeth are acrylic jackets, small space pontics in full casting procedures lingual pontics for acrylic fixed bridges, acrylic faced fixed bridges sanitary pontics for posterior fixed bridges tube teeth for castings and unilateral partial dentures, and anterior tube teeth instead of porcelain facings

Satisfactory acrylic jacl ets can be made by trimming off the lingual surface of an acrylic tooth and placing the tooth on a jacket preparation die and rewaxing a new lingual surface This jacket is removed from the die and invested in dental stone After the wax is melted from the acrylic facing it is replaced by tooth shade acrylic and the jacket is processed The finishing a d polishing is the same for any other plastic material

In full casting (gold or chrome cobalt) procedures a small acrylic bicuspid or molar tooth can be placed in the wax pattern on the refractory model and left there in toto When the wax pattern has been burned out, the acrylic tooth is burned out as well The resulting casting has a very nice shaped tooth in metal, instead of a poorly defined slug of metal

Acrylic bridges can be made with a solid lingual area of metal by using the lingual surface of an acrylic tooth as the pontic The labial area must first be trimmed off the tooth and the lingual area scooped out for later retention of the tooth shade acrylic The resulting plastic shell is invested in dental stone and burned out and cast in gold It is then soldered to the abutment 3/4 crown Tooth shade acrylic is packed into the metal cast plastic lingual pontic

For acrylic faced bridges the process is the same as for acrylic jackets After the lingual surface has been trimmed off the

From the Central Dental Laboratory 2d Med Detachment U S Army

acrylic tooth or teeth are placed against the metal connector of the bridge and the lingual area rewaxed After the plastic has been processed it is then trimmed and polished

At times it is difficult for some technicians to carve posterior teeth The acrylic molar tooth saves time and effort in such instances An acrylic molar tooth is used entirely except the diatoric area is waxed to the contour of the sanitary bridge pontic It is then invested cast and soldered to the two abutment crowns

Tube teeth are easily made by cutting a hole in the center of an acrylic tooth and placing it in the wax pattern A center post for retention is waxed directly to the pattern through the hole in the tooth After the tooth is removed the pattern is cast in the usual manner By means of either quick cure acrylic or crown and bridge cement the plastic tooth is fixed permanently to the metal framework

In the anterior areas of the mouth where a porcelain facin would be too small or the bite too closed any anterior plastic tooth can be prepared with satisfactory results in the same manner as the tube tooth

Acrylic plastic teeth have a definite place in prosthetic procedures despite their known deficiencies As time goes on more and more uses will be found for these teeth in dentistry to the common benefit of the patient and the dentist

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Blood Vessel Surgery

The e is probably no field of urg ry in which greater adv nces have b en made in ecent years than that of blood v ssel surg ry Great st des h ve be n m d s nce Kocher stated that the surgeon who touched the heart hould lose the respect of his colleagues Today cardiac and m jor blood ves l surgery are almost a commonplace s ap- pendect my was n the ninet en hundreds

The new card ac oper tions and surgical proc dures on the major per phe l rter es a d the port l system have be n m d poss ble only by rigorous and p olonged t aining in the experime tal l borat ry The vascular surgeon of tod y must of neces ity be a phys ologist and an exp r mental st a well as surg on

—ALTON OCHSNER M D
n the *Su g cal Cl n s of No th Amer a*

USE OF THE IBM IN NEUROPSYCHIATRIC CASE STUDY

JOHN C MEBANE *Majo USAF (MC)*

A FILING system which gives ready access to illustrative case material and provides for adequate cross reference studies has been developed for the department of neuro psychiatry of this school by the use of International Business Machines punch cards The task of adapting the data desired to the operations of the machine, and the desire to keep paper work to a minimum required several revisions before a workable system was devised Because many clinicians may be interested in this problem, I believe that publication of this report system may be of general interest.

A clinical form (fig 1) is completed for each patient who is referred to the department for study and teaching purposes This is accomplished merely by circling the appropriate number or numbers under each of the 26 headings on the form This particular form is designed to record data concerning the problems of flying personnel The diagnostic terms and numbers used are from the Joint Armed Forces Statistical Classification and Basic Diagnostic Nomenclature Certain items which are difficult to qualify, *e g*, genetics, dynamics, and mechanisms of defense, require careful evaluation before submitting them for statistical analysis

Upon completion of the clinical form, the items circled are punched by an operator of an IBM machine directly onto a general purpose detail card The item numbers on the clinical form denote the columns on the card which are to be used

There are many practical uses of the filing system A student medical officer may wish to listen to sound recordings or interviews with older officers who profess a fear of flying or the department may wish to run a statistical survey of the number of medically ill persons studied on referral from the base stockade Studies of psychosomatic conditions in various groups might also be made These data can be obtained from appropriate cards selected by the machine

From U S A Force School of Aviation Medicine Randolph Air Force Base Texas

acrylic tooth, or teeth are placed against the metal connector of the bridge and the lingual area rewaxed After the plastic has been processed it is then trimmed and polished

At times it is difficult for some technicians to carve posterior teeth The acrylic molar tooth saves time and effort in such instances An acrylic molar tooth is used entirely except the diatoric area is waxed to the contour of the sanitary bridge portic It is then invested cast and soldered to the two abutment crowns

Tube teeth are easily made by cutting a hole in the center of an acrylic tooth and placing it in the wax pattern A center post for retention is waxed directly to the pattern through the hole in the tooth After the tooth is removed, the pattern is cast in the usual manner By means of either quick cure acrylic or crown and bridge cement the plastic tooth is fixed permanently to the metal framework

In the anterior areas of the mouth where a porcelain facing would be too small or the bite too closed, any anterior plastic tooth can be prepared with satisfactory results in the same manner as the tube tooth

Acrylic plastic teeth have a definite place in prosthetic procedures despite their known deficiencies As time goes on more and more uses will be found for these teeth in dentistry to the common benefit of the patient and the dentist

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Blood Vessel Surgery

The probably no field of surgery in which greater advances have been made in recent years than that of blood vessel surgery Great strides have been made since Kocher stated that the surgeon who touched the heart should lose the respect of his colleagues Today cardiac and major blood vessel surgery is almost as commonplace as an appendectomy was in the nineteen hundred

The newer cardiac operations and surgical procedures on the major peripheral arteries and the portal system have been made possible only by rigorous and prolonged training in the experimental laboratory The vascular surgeon of today must of necessity be physiologist and an experimentalist as well as a surgeon

—ALTON OCHSNER M D
in the *Surgical Clinics of North America*

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Regular Medical Corps Officers Certified by Specialty Boards

Beginning in this issue the Journal *will publish each month the names of the regular officers of the Medical Corps of the Army, Navy and Air Force who have been certified by one or more of the various specialty boards approved by the American Medical Association* —The Editors

The American Board of Ophthalmology

Established in 1917, the American Board of Ophthalmology is the oldest of the specialty boards According to current information from the Offices of the Surgeons General of the three military departments, the following 74 regular officers have been certified in this specialty

Be j m N Ahl *Capt. USN*
Arnold A Albright *C l USA*
Harry D Arn ld, J *Maj USAF*
Mar hall B Atkin on *Maj USA*
Th m E Atki on Jr *Lt Comdr USN*

Harry B noff *Capt USA*
Otto C. B umg rt *Comdr USN*
W ll m L Berkley *Capt USN*
J hn H B k t n Jr *Maj USAF*
B rna T Bowe s *Col USA*
J k H. Bt t w *Col USAF*
Jam s W Br w *C l USAF*
H ary G B llw nk l *Capt USN*
V cto A Byrn *Col USAF*

F d ck R Car ke *Capt USA*
Jul B Ch pma *Lt Col USAF*
Or W Ch nault *Capt. USN*
W llard H Cle l nd *Lt. Col USA*
J hn F Conn l Jr *Maj USA*

J hn E Edwards *Maj USA*

R ha d S Fi tt *Col USAF*
N tha el E F wl r *Lt USN*
J m L F ll g *Comdr USN*
Sh ley A Fuhring *Comdr USN*

R bert D G ll m *Lt. Comdr USN*
P r J G tta *Comdr USN*
Orvill M Gr Jr *Lt. USN*
J s ph J G ly h *Lt Col USAF*

J ck H Hall *Maj USAF*
Fr derick Harb t *Capt USN*
A lm C Hoh *Capt USN*
K n th E H d o *Lt Col USA*
F est E H ll *Lt Col USA*
Edw rd A Hynes *Comdr USN*

A b ey L Jenni g *Col USAF*
J ph M Jord n *Comdr USN*
L wi G J d *Capt. USN*

Richard L K p r *Capt USA*
J hn H K g Jr *Col USA*
Edw rd Kul y k *Comdr USN*

G g E L th op *Lt Col USA*
R bert N Lehm *Lt Col USA*
A t Low y Jr *Col USA*
Arth W Loy *Capt USN*

K rl D M cM ll *Col USA*
J hn J M lo y *Lt Col USA*
J h T M rt n *Lt Col USA*
E l Ma w ll *Br g Gen. USAF*
W rthy W McK y *Maj USA*
J y F M llet *Capt USN*
D w n A M ll *Comd USN*

R d lph P N dba h *Lt Comdr USN*

Sam l H Ol t *Comd USN*
N l O Ols *Comdr USN*
Th m s L O m t *Lt Col USA*

Th i th f t t ers s Th m f ff e t f d ot lary gology will be publ hed n th N mbe

K I J P lmb g *Comdr USN*
R y R P w ll *Capt USN*

Emm J Ry *Capt USA*
S ph J Ry *Capt USN*

L w S ha h *Lt USN*
F k E Schwar *M j USA*
H W Shr k *Lt Col USA*
W ll m T S h *C I USA*
Jar ud B Sm h J *Comdr USN*
W ll m L Sm th *Lt Comdr USN*

B gh So od h *Maj USA*
W ll m L Sp ld g *Col USA*
R ha d U S t *Maj USA*
J H S t *Comdr USN*
Cl ff d A Sw *R ar Adm USN*
L S Szakalun *Maj USA*

G g L T b J *Comd USN*

A h y J V dal *Col USA*

F X W l *Maj USAF*

One of the most common complaint of persons with low back pain is inab lity to sit in comfort with difficulty in straightening the back on r ing This is particularly noticeable after long sitting in a lounge chair an automobile or a theater eat all of which are supposed to be comfortable Th s comm n complaint must repre nt some f n dam nt l defect n our conception of the cor ect s tti g position and in the design of chairs and eats for nly young persons with elastic ligament and no ba k pa n can tolerate sitting for long in the type of se ts commonly des gned Older per ns who use chairs more often do not have this elastic ty and often sit in di comfo t

—J JAY KEEGAN M D
in the *Journal f Bone and Joint Surge y*

At present the cumulative eff ct of coustic trauma is unconfirmed by expe ment l data The p oblem basically needs further d finition By m t is nterp eted a me ning that once a subject has suffered hear ng d mage he b com s mo e sensit ve to further damage by no of le e nt nsity than when h s he ring was n rmal To oth cumulati ffect means th t although a certain no se may be in c ently loud to p oduce mmed ate hear ng damage if the subj expo ed t the no se repeatedly or for a sufficient length of ti subcl nical he r ng loss will acc mul te and become m nifest audi gram Each of these interpretati ns neces tates cons mor inve t gati n and consideration

—JOSEPH SATALOFF M D
in *A M A Arch ves of Otola*

BOOK REVIEWS

Operative Neurosurgery With Emphasis on Procedures in Trauma by *Elisha Stephens Gurdjian* M D *Professor of Neurosurgery* Wayn Uni ver ity College of Medicine *Chief University Neurosurgical Service* Grace Hospital Detroit, Mich and *John E Webster* M D *Assistant Professor of Surgery* Wayne University College of Medicine *Uni versity Neurosurgical Service* Grace Hospital Detroit Mich 422 pages illustrated The Williams & Wilkins Co Baltimore Md publishers 1952 Price $10

This book is unique for its style, illustrations, and relatively low cost The authors have directed their efforts tow ard pre senting standard procedures in neurologic surgery under four headings head, spine, sympathetic nervous system, and periph eral nerves Those procedures done in a special or abbreviated manner by neurosurgeons are not described The book is, there fore, valuable in presenting the technics used in the senior author s clinics The illustrations are multiple action and mul tiple plane drawings and for the most part, face the page of the text giving the description of the procedures

Gurdjian and his associates have done much experimental work in head injury mechanisms The results of their studies are reflected in the chapters on head and back injuries General surgeons residents and others who initially see the patient with such injuries will appreciate the detailed instruction given Each chapter contains an interesting and detailed histor ical account that assists in understanding the development of present day surgical technic The bibliographies are very ex tensive and furnish source material for a more d tailed study Interspersed throughout the book are short anator ical summaries of neurosurgical approaches to structures

This book has a style of its own and pre ents a great deal of pertinent information concisely and accurately There is over simplication in some instances, and the pre entation of cer ideas are open to discussion The chapter on cerebral aneu rysms is very brief more information on surgical approach to the various vessels and the treatment of complications due to the ligation of main vessels would be helpful In cervical in juries laminectomy should be performed when it appears from roentgenographic study that a fracture has produced pressure on the spinal canal skeletal traction alone should re

pletely relied on It was not the authors intention to describe numerous approaches to the same regions however and other technical criticism is of a minor nature and does not detract from the value of the book

This volume should be in the libraries of our military hospitals neurosurgeons general surgeons and others responsible for emergency treatment of head back and peripheral nerve injuries will find it a valuable reference and source book

—Lt Col R C Greenwood MC, USA

A l R w f M d by W d C C tt g Ed St ford U
ty S h l f M d c d H ry W Neum A Ed
St f d Un ty S h l f M d V l m 4 452 p g A n al
R w In St f d Cal f p bl h 1953 P $6

The editors have selected internationally known authors to compile a review of the publications of the past year in their particular field of medicine The articles selected for analysis are new unusual or outstanding contributions to the subject Special attention is given to the latest developments in the treatment of diseases as well as to a critical analysis of recent scientific work in each specialty An extensive bibliography follows each chapter The subjects are presented by systems and include chapters on infectious diseases radiology obstetrics and plastic surgery The authors are particularly adept in bridging the continuity of the various articles thus producing an extremely interesting presentation and one which is timely and informative They can be commended for their conservative views their constructive criticism and the accuracy of their statements This book is an excellent digest and a useful reference for all physicians but particularly for those who do not have an opportunity to keep up with the current medical literature *—Lt Col F A Goss USAF (MC)*

Psych D t on y W th E y l p d T m t f M d T m by
l l d E H M D F m ly P f or f P ychiatry C ll g
f Phy d Surg C l mb Un ty N w Yo k A t
Dir N w Y k St t P y h tr I t t t d H p t l d
J b Sb tzky Ph D R rch L b N w York S P y-
h I d H p t l 2d d w th ppl m 781 p g
O ford U y P N w Y k N Y p bl h 1953 P $15

This book is without a peer in its particular field because it is the only relatively complete dictionary which covers in encyclopedic fashion the various terms and concepts of all the more acceptable schools of psychiatry Attention is also given to allied fields such as clinical neurology constitutional medicine mental deficiency the social services genetics and eugenics It fills a vital need in a field where semantic confusion and misunderstanding is the rule rather than the exception The spelling pronunciation and derivation of terms is given and

most important, the source of the definition in most instances For the beginner or resident in psychiatry it is a valuable an necessary reference source, and provides current informatio for the busy practitioner of psychiatry

Publication of the second edition in two parts is economica to those already possessing the first part, and also allows a quick perusal of all the more recent terms in one compact loca tion The definitions are simple, concise, and easy to understand To the original 6 113, 902 new definitions have been added and the same careful attention to accuracy and detail has been maintained Ownership of this publication is heartily recom mended and it should find its rightful place alongside the standard medical dictionary of any practicing psychiatrist or of anyone working in an allied field

—*Lt Col R R Cameron MC USA*

The Wechsler-Bellevue Scales a Guide for Counselors by *C H Patterson* Veteran Administration Center Fort Snelling St Paul Minn American Lecture Series Publication Number 148 A Monograph in The Bannerstone Division of American Lectures in Psychology edited by *Milly Harrower* Ph D Research and Consulting Psychologist New York N Y 146 pages Charles C Thomas Publisher Springfield Ill 1953 Price $3 75

The book represents a revision and expansion of material prepared in 1948 in mimeographed form by the Veterans Administration Regional Office Minneapolis Minn under the title *Using the Wechsler Bellevue Scales in Counseling* The volume consists of a recapitulation of the researches with the Wechsler Bellevue test in clinical diagnosis, measurement of mental deterioration aptitude measurement and short forms of the test In each case there is a discussion by the author followed by a summary and conclusion Throughout the emphasis is on the statistical findings and generally the conclusions point out that the test is valueless or limited in the areas discussed

If psychologic instruments had value only in terms that the extent described by statistical research studies we would have to discard our most valuable tools, including the [illegible] and other key technics in clinical use The persistent negative conclusions toward which the quoted studies lead the author are more likely to confuse the counselor or clinical psychologist than guide him Except for some constructive [illegible] of the short form of the test and a table showing the correlations between the Wechsler Bellevue and other [illegible] there is very little useful material offered which [illegible] in a counseling situation The book is [illegible] ment Its publication in present form, [illegible] conclusions fail to take into account the [illegible] of those who have used the test [illegible]

diagnosis As a guide for counselors it is a misnomer Actual ly the book represents little more than a well done review of the research literature —*Maj T C Kahn USAF (MSC)*

Th P y h p th D l q d Cr mi l by *G org N Th mp* M D F A C P A t Cl l P f o f N logy d P y h try S h l f M d n U ty f S th C l f L A g l C l f F me ly Ch f f P y h S Lo A g l C unty G n l H p l P ych t Con lt Depa tme f C ect on St f Cal f ia F ll w f th Am P y hiat A oc t on F llow f th Ame A d my f N l gy 157 p g ll trat d Ch l s C Th m P bl h Sp gf ld Ill 1953

This carefully thought out and well written book is a plea for more painstaking scientific evaluation and handling of the psychopathic criminal Based on medicolegal experience over many years the author proposes special methods of handling and treating these criminals in separate institutions The need for such facilities is well known to the psychiatric profession The organic basis for the psychopathology discussed is emphasized but too little attention is paid to the current dy namic concepts in psychiatry I do not believe that the author proves his thesis

The format and printing of the book are excellent

—*Comdr F H Ocko MC USN*

C d t A th by *G g P P tk* M D F A C S F I C A d d by *J m L S thw th* M D F A C S F m ly Se Surg U S P H S F me ly Co-Dir t C d la Cl P bl H lth S H p t l B lt mor Md A d g Surg E T T b l H p t l d E t T B p t H p l K o lle T n ; *R b t A H g n,* M D F A C S F I C A F I C S F (F l y f A t) R C S (E gl d) F D t A h t Wom D (Ph lad lph a Ly g In H p l) f P syl Ho p t l F t P f f A th ia U y f T S h ol of M d F me ly S Surg U S P H S F m ly A oc t P f or f Ob tr J h H pk U ty P f or f A h W R rv U y Cl I d Oh d *W f d M P tk* M A (Ox) B M B Ch (O) M R C S (E g) L R C P (L g) M D A t n S g y t h I t G org P P tk 2d d t on 1 005 p g 585 llus a J B L pp t Co Ph lad lphia P p bl h 1953 P t $22 50

The second edition of this authoritative book has been thor oughly revised to keep pace with the tremendous progress made in the application of conduction anesthesia during the past decade Pitkin s basic concepts still remain the foundation of the text and there have been very few changes in the cl apters he wrote The section on pharmacology of local anesthetics has been brought up to date New chapters on the vertebral canal and its contents topical anesthesia and complicati con duction anesthesia have been added The chapter

anesthesia in the first edition have been condensed to a single chapter and almost completely rewritten The most striking feature is the large number of excellent anatomic plates and illustrations Many of the illustrations of anesthetic methods are accompanied by anatomic inserts showing the detail of needle approach, which should aid the beginner

This book is the most complete and comprehensive single volume on conduction anesthesia in the current literature and is highly recommended to both anesthesiologists and surgeons

—*Condr J G Kurjees MC USN*

Physiological and Therapeutic Effects of Corticotropin (ACTH) and Cortisone by *Dwight J Ingle* B S M S, Ph D Senior Research Scientist (Physiologist) Research Laboratories the Upjohn Company Kalamazoo Mich and *Burton L Baker* B A M S Ph D Professor of Anatomy University of Michigan Medical School Ann Arbor Mich American Lecture Series Publication No 179 A Monograph in American Lectures in Metabolism edited by *Paul Gyorgy* M D Department of Pediatrics University of Pennsylvania School of Medicine Philadelphia Pa *Louis Leiter* M D Division of Medicine Montefiore Hospital New York N Y and *S O Waisman* M D The Lilly Research Laboratories Indianapolis Ind 172 pages Illustrated Charles C Thomas Publisher Springfield Ill 1953 Price $5 00

This monograph is a concise review of the effects of corticotropin and cortisone which meets a need of the student seeking illumination without reading voluminous literature on the subject There is an excellent bibliography with key references In addition to corticotropin and cortisone attention is given to hydrocortisone and other biologically active steroid compounds of the adrenal cortex which are of therapeutic importance The authors are authorities in the field and have sought the guidance of clinical investigators in preparing the chapters that review the therapeutic effects of these hormones

The monograph deals with the history of the compounds present concepts of the relationship between the anterior hypophysis and the adrenal cortex electrolyte and water metabolism circulation functional changes in the nervous system organic metabolism growth, normal tissues and normal and injured connective tissue There are chapters devoted to general considerations of the clinical use of cortisone and corticotropin and to various uses in rheumatic allergic and connective tissue diseases and those of the skin and eye blood and blood-forming organs and miscellaneous diseases such as ulcerative colitis and regional enteritis The undesirable effects of cortisone and corticotropin are reviewed One chapter deals with adrenal cortical insufficiency in man, with reference to Addison's disease, ablation of the adrenal glands, anterior hypophyseal insufficiency and endocrine dysfunctions There is a final chapter devoted to the speculation on the nature of adrenal cortical

hormone action The bibliography includes 324 references There is no index but the table of contents is adequate for reference

This monograph serves as an easy reference for the physician and graduate student alike and is recommended for Armed Forces medical libraries —*Comdr T D Cuttle MC USN*

V ru d R kett l Cl f t on d N m lat t by *S MacF l B et E nst M y L M Bl ck F O H lm s J m J hn C H A d u P L ma t G ff y W R k M k H Ad m A A B t t H ald R C x J D W A C l C el B Ph l p G H B g ld Edwa d A. St b us F C B d k. F M y G J hn B dd gh W M D H mm P rr L p d Alb t B S b* O gi lly p bl h d A l of h N w Y k A d my f S V l m 56 A t l 3 p g 381-622 Ill t d Th N Y k A d my f S N w Y k N Y p bl h t 1953 Pt $4

In January 1952 the Section on Biology of the New York Academy of Sciences sponsored a meeting which dealt with the classification and nomenclature of virus and rickettsia This publication by that organization contains the papers presented at the meeting All of the known groups of viruses and rickettsia of importance in human disease and also certain groups significant to insects and plants are included in this volume The contents consist of 31 individual papers each by an outstanding authority on the subject which present known information on the means for qualitatively and quantitatively characterizing virus and rickettsia

The publication is a valuable up to date reference on the subject and should be an asset to the reference library of scientists interested in microbiology

—*Lt Col F L Bauer MC USA*

Th R ts f P ych h py by *C l A Wh t k* M A M D P f or f P y h t y d Ch m f th D p rtm t f P y h t y Emory U y Sch l of M d d *Th ma P M l* M A Ph D A P f s f P y h t y d D t f R h D pa m t f P y h t y Emory U ty S h l f M d 236 p g l t d Th Bl ki t C N w Y k N Y p bl h 1953 P $4 50

Because of the varied approaches to psychotherapy and the different technics used there has long been a need for a scientific formulation of the art of psychotherapy This monograph proposes such a formulation As a means of communicating with other workers in the field and as a stimulus for further refinement of a conceptual basis for psychotherapy it is largely successful Although some of the theories advocated and terminology used will be questioned by many psychotherapists the monograph is stimulating and thought provoking and will be useful in furthering research in and teaching psychotherapy It is divided into three sections The first section entitled Foundation

deals with the relationship of psychotherapy to general biology and includes chapters entitled "Research in Psychotherapy" and "The Community and Psychotherapy." The second section, "Process," presents a formulation of the essential phases and the dynamics of the psychotherapeutic relationship. The third section, "Techniques," contains some technics found useful in psychotherapy by the authors.

—Lt Col O W Weaver MC USA

Epidemics in Colonial America by *John Duffy*. 274 pages. Illustrated. Louisiana State University Press, Baton Rouge, La. Published 1953. Price $4.50.

Delving into all types of contemporary diaries, correspondence, journals, histories, descriptions, newspapers and official records, the author has evolved a well documented, comprehensive, historical summary which gives a vivid word picture of the epidemics of infectious diseases which plagued the American colonists during the seventeenth and eighteenth centuries. They include smallpox, diphtheria, scarlet fever, whooping cough, malaria, yellow fever, typhoid, and the dysenteries. During that period little was known about the causative agents, epidemiology, treatment or methods of prevention, and control of these infectious diseases nor were any reliable morbidity and mortality statistics recorded.

Those who remember only the brighter aspects of our country's early history may be shocked by the author's revelation of the extent to which the colonists suffered and died from these infectious diseases which, for the most part, have been either eradicated or are now preventable. This book makes one realize how recently these diseases were uncontrolled and also the marked progress in preventive medicine that has been made during the past 50 years. This book merits the attention of all who are interested in the health and welfare of mankind.

—Col L G Thomas MC USA

Radiations and Living Cells. An Introduction to Radiation Biology in Which the Action of Penetrating Radiations on the Living Cell is Described with Special Reference to the Effect on Cell Division in Human Tissue by F G *Spear* M D M A D M R E Member Scientific Staff Medical Research Council Strangeways Research Laboratory Cambridge. 222 pages. Illustrated. John Wiley & Sons, Inc. New York N Y publishers. 1953. Price $3.50.

This small volume of 213 pages might be described as a primer dealing on the subject of radiobiology. The author has apparently done a great deal of experimental work with the effects of radiation on plants and experimental animals which he uses to illustrate many points.

The first half of the book is a review of normal cytology followed by a discussion of alteration in cell structure after ex

posure to radiation The balance of the book deals with the effects of radiation on each type of body tissue There are dis cussions on such subjects as effects from whole body irradia tion effects of radiation on tumor cells, and finally a consider ation of the various theories as to how penetrating rays pro- duce their effects on living cells

The book deals with the elements of a very timely subject and it is presented in an interesting manner There are a number of black and white illustrations The type is large and easy to read It is recommended to the physicist interested in a career associated with a hospital for the residents in radiology and in medicine and for the senior student who may be interested in the field of radiation therapy It may well be of interest to those who are concerned primarily in atomic defense who may wish to gain a broader knowledge of the agent with which they are dealing —*Comdr C D Burroughs MC USN*

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479 p g ll t t d Ch l C Th ma P bl h Spr gf ld Ill
1953 P $10 50

This impressive volume edited under the able direction of Webb Haymaker consists of 133 sketches and portraits of pioneers in the field of neurology Included are such names as Meynert *Purkinje Pavlov Goltz Brissaud Cushing* Frazier and Elsberg While the aim of the book is to weave into the text a running history of neurology rather than having it consist merely of a series of disconnected biographies it nevertheless memorializes those whose patient investigative efforts and brilliant incisive reasoning have penetrated the darkness of the neural jungle Prepared by 84 present-day neurologists these sketches represent all the neurologic disciplines anatomy physiology pathology neurosurgery and clinical neurology The vast resources of the Armed Forces Institute of Pathology and the Army Medical Library were available for this collabora tive effort

The volume was conceived in 1948 and prepared to serve as a *vade mecum* to an exhibit sent to the Fourth International Neurological Congress by the Armed Forces Institute of Pathol ogy Although publication was delayed it will be welcomed now by a wide audience including both scholar and layman for whom it will become a basic reference Author and reader alike will share a sense of gratitude to the publisher for the pro- fessional skill with which he has produced the volume

—*W I Link Ph D*

The Autonomic Nervous System by *Albert Kuntz* Ph D M D Professor of Anatomy in St Louis University School of Medicine 605 pages illustrated 4th edition thoroughly revised with 94 illustrations Lea & Febiger Philadelphia Pa publishers 1953 Price $10

This standard reference textbook has been revised and in part rewritten The first 400 pages are devoted to gross anatomy, histology physiology, and histopathology of the autonomic nervous system It is discussed as a whole and then in greater detail as it pertains to the heart, blood vessels, respiratory system, gastrointestinal tract, urinary tract, endocrine glands, genital tract, skin, and skeletal muscles The presentation and illustrations are excellent The author presents basic concepts and experimental work as well as recent advances up to 1952 The remainder of the text is devoted to chapters on visceral sensitivity and referred pain, autonomic imbalance, the autonomic nervous system in disease, and surgery of the autonomic nervous system The chapter on disease appears to overemphasize the role of the autonomic nervous system and is based largely on experimental work and theories promulgated prior to 1940 No mention is made of Selve s contribution Most physicians do not accept the theory that Addison s disease is due to dysfunction of the autonomic nervous system or that production of antibodies is a function of this system The bibliography is extensive and complete

—*Col F H Mowrey MC USA*

Veterinary Dermatology by *Frank K al* V M D M V D (h c) Doc hab l Associate Professor of Veterinary Medicine University of Pennsylvania Philadelphia Pa As oci te author *Benjamin J Novak* Ed D Chairman Science Departm t Murrell Dobbin Vocational Technical School Philadelphia Lecturer Temple University Philadelphia Pa Introduction by *John D Beck*, V M D Profe so of Veterinary Medicine University of Pennsylvania Philadelphia Pa 325 pages 162 illustration in 124 figures J B Lippincott Co Philadelphia P publishers 1953 Price $10

This is an excellent and long needed text on a subject that is of great importance in the field of veterinary medicine and is the first to be printed in the English language The book has a brief appendix and both bibliographic and subject indexes

The 21 chapters present the general subject of veterinary dermatology in all its phases in domestic animals The early discussions are devoted to such basic considerations as the examination of the skin and the classification of skin disorders Subsequent chapters deal with more specific topics such as eczema, otitis externa in dogs drug eruptions photosensitization skin tumors and functional diseases of the skin Four chapters are concerned with the skin manifestations of various diseases caused by viruses, bacteria fungi and protozoa while the last three chapters cover the dermatoses associated with meta

zoan parasites Symptoms prognosis and treatments are given for the various conditions described The material presented is authoritative well referenced and up to date For example, the current vesicular exanthema epizootic is discussed and the various subjects are handled with a desirable degree of brevity —*Lt Col I H Willers VC USA*

S I N R o Cy t A the Ca of th S t C d Eq Sy dr m by *I. M. Talov* M D P of or f N ur l gy d N uro g y N w Y k M d l C ll g N w Y k N Y 134 p g ll t t d Ch l C Th m P bl h Sp ngf ld Ill 1953 P $6 50

This is a well written monograph on the pathology clinical diagnosis and treatment of perineurial cysts This condition is presented as a possible explanation for the symptoms that are frequently attributed to ruptured nucleus pulposus The avowed purpose of the monograph is to sharpen the awareness of physicians to the existence of such cysts with the hope that they will be discovered more frequently The author postulates that these cysts which are usually attached to the sacral nerve roots within the sacral canal are the result of previous perineurial hemorrhages that in turn have been caused by systemic disease or trauma The pathologic findings have been thoroughly studied Clinically the symptoms vary from those of lower lumbar root involvement to those of lower sacral root involvement. They may be accompanied by roentgenographic evidence of thinning of the roof of the sacrum by tenderness over the sacrum and occasionally by myelographic evidence It is suggested that when discovered the treatment of choice for a single cyst is total excision whereas in multiple cysts piece meal excision with sparing of the roots should be practiced The author states that usually there is complete relief from symptoms

—*Comdr H S Colony MC USN*

D ur Th py Th Ph m logy f D ur t Ag d h Cl l M g m f h Edem t P t by *Alf d V gl* M D A t P f f Cl l M d N w Y k U y C ll g f M d A V t g Phy Th d M d l D B ll vu H p l As t V g Phy M d c l D on M p l t H p l N w Y k N Y F me ly A t V g Phy P l l H p t l V d Cl l A ta G y H p l M d l S h l L d 248 p g ill t a d Th W ll m & W lk C B l m Md p bli h 1953 P $5

The author of this treatise was the first physician to observe the diuretic effect of an organic mercurial compound which was being used for the treatment of syphilis Since that observation diuretic therapy has become of major importance in the mana e ment of many conditions where water retention by the body is a factor He systematically discusses the cau es of edema formation the physiologic chan e that occur and the role of

the kidney and sodium retention in this condition He reviews the pharmacology of diuretic drugs and the antidiuretic agents The organic mercurials are discussed in detail Such complication as the low salt syndrome, hypochloremic alkalosis, hypokalemia and other side effects are briefly but adequately covered The bibliography contains 725 references

This book is an excellent reference for physicians interested in the etiology and therapy of fluid retention

—Col D O Lynn, MC, USA

Gout and Gouty Arthritis Modern Medical Monographs No 7 by *John H Talbott* M D Professor of Medicine The University of Buffalo School of Medicine Physician-in-Chief Buffalo General Hospital Buffalo N Y 92 pages illustrated Grune & Stratton Inc New York N Y publishers 1953 Price $4

This volume presents a review of the recent advances in the knowledge of gout and purine metabolism, in compact and readily accessible form with emphasis on its clinical aspects The scope is more comprehensive than that given this subject in recent textbooks of medicine, but less detailed than that in some special texts on metabolism and in systems of medicine An adequate bibliography of 88 references and an index are included

Controversial issues are clearly indicated and the author fairly states his own position He favors the belief that the increased formation of uric acid without initial decreased renal excretion is the primary metabolic defect in gout and that hormonal imbalances play a secondary role, if any The concept of the miscible pool" of uric acid, which the author and his coworkers have done much to develop and the broad assumptions upon which it is based, are clearly presented However no consideration is given to the concept of diffusible vs protein bound uric acid held by Adlersberg and others Twenty four excellently selected and reproduced roentgenograms are included, and the author wisely emphasizes the nonspecificity of many of the findings Therapy of gout is extensively considered The author agrees with most authorities that colchicine is still the agent of choice in acute gout, and that cinchophen has no place in the therapeutic armamentarium Contrary to most writers, and justified by his extensive personal experience he advocates the use of small doses of colchicine in interim or intercritical gout Less stringent dietary restrictions are advocated now than in former years

The format of the book is attractive and an excellent summarization of currently recognized fact and theory on the subject is presented *—Lt Col F J Hughes Jr MC USA*

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This edition embodies a number of revi ions and additions designed to conform with the present-day concepts of denture construction Important are the changes in the chapters dealin with secondary or final denture impressions the vertical di mension of the denture space the centric and other positional relations of the jaws the selection and arrangement of the teeth and the technical phases relating to the proce sing of acrylic denture resins

There are 24 chapters arranged in an orderly fashion be ginning with the Objectives of Denture Construction and pro-ceeding through a discus ion of oral anatomy and physiology in relation to total body metabolism and the mechanics of den ture construction tooth selection and the maintenance of den tures

In the chapter concerned with the making of prosthesis for edentulous persons with anomalies case reports of unusual conditions are included with a discussion as to cause and pos sible corrective measures

I recommend this book highly as presenting an excellent coverage of the subject of complete denture prosthesis

—*Col J L Bernier DC USA*

Th Dy mi f P y h ma D try by *J ph S L d* D D S d
ix t *b t* 435 p g D tal I ms f I t P bl h g *Co*
I D kly N Y p bl h 1953

This book surveys the medical and dental specialist s profes sional obligation to properly integrate treat and analyze man s phy ical ailments by a better study and understanding of the total per onality involved It is composed of 42 chapters and has six distinguished contributors The contents thorou hly cover the en tire field of psychosomatics in dentistry with the exception of hypnotherapy and hypnosis The latter are treated li htly but there are several well known books devoted almost entirely to these phases of psychosomatics

The book fills a much needed void in pointing out the nece sity for more complete understanding of psychosomatics in den tistry All dentists should benefit by reading this work and find it most valuable It is recommended with enthusiasm especially to the younger practitioner —*Lt Col W B Simms DC USA*

BOOKS RECEIVED

Surgery of Trauma edited by *Warner F Bowers* Colonel MC USA formerly Chief Surgical Consultant Office of the Surgeon General with forewords by *M lv n A Casbe g* M D Chairman Armed Forces Medical Policy Council and *Su geons Gen ral of the Army the Navy and the Air Force* 605 pages 284 illustrations J B Lippincott Co Philadelphia Pa publishers 1953 Price $15

Nutrition in Health and Disease by *Lenna F Cooper* B S M A M H E Sc D Consulting Dietitian and Formerly Chief of the Department of Nutrition Montefiore Hospital New York City Formerly Food Director University of Michigan Dean of School of Home Economics Battle Creek College and Supervising Dietitian U S Army World War I President American Dietetic Association 1937 1938 *Edith M Ba ber* B S M S Writer and Consultant Food and Nutrition Food Editor General Features Syndicate Formerly Food Editor New York Sun and Lecturer on History of Cookery and Public Relations for Home Economists Teachers College Columbia University *Helen S M tchell* A B Ph D Dean of the School of Home Economic Univer ity of Massachusetts Formerly Research Profes or of Nutrition Univer ity of Massachusetts Principal Nutritionist Office of Defen e Health and Welfare Services and Professor of Physiology and Nutrition Battle Creek College and *Hende ka J Rynbe gen* B S M S Associate Professor of Science Cornell Unive sity New York Hospital School of Nursing Formerly Director of Dietetics American University Hospital Beirut Lebanon Food Clin c D etitian Vanderbilt Clinic Presbyterian Hospital New York Food Clini D etitian Barnes Hospital St Louis and Nutritionist Community He lth Association Boston 12th edition 790 pages 130 Illustrat ons 5 in color J B Lippincott Co Philadelphia Pa 1953 Pr ce $4 50

Psychosomatic Approach to Gynecology and Obst trics by *Fritz Weng af* M D Adjunct Neuropsychiatrist B th I ael Hospital New York N Y American Lectur Ser e P blic tion N mber 164 A Monograph in the Bannerstone D v n of Am can Le tur s in Gynecology and Obstetrics ed ted by *E C Hamblen* B S M D F A C S Professor of Endocrinology A oc te Prof s or of Obstetr cs and Gyn cology Duke University Sch l of Med ci e Chief of the Divi ion of Endocrinology and Endoc nolog t D ke Ho p tal Durham N C 346 pages Charles C Th m s Publish Sp ngf eld Ill 1953 Price $6 75

Endocrinology in Cl n c l Pra t ce d t d by *G lbe t S Go dan* M D Ph D A stant Profe sor of M d c ne Un v rs ty of Cal fornia School of Medic ine nd H L sse M D Cl n al P fessor of Medicine and End c nology nd Ch f Th Endoct n Clinic University of Cal fo nia School of Med c ne Former P dent Association for the Study of Int rnal Se et on (Now The Endoct ne Society) 407 pages illu trated Th Yea Book P bl he Inc Chicago Ill 1953 Price $10 50

H dbook of D et ti f t Nur s by *C th F H rr* S R N D tet D plom R C N Ch f The pe ti D t tia U r y C ll g H p t l f word by Pr f s *S J C u ll* M B F R C P P o- f f D t U e ty Coll g H p t l f d cal S h ol 196 p g ll tr t d Th Will m & W lk C B l im Md p b- l h 1953 Pr $4

P bl m i th A t my f th P l Atl by *Edua d Ubl h th* Ph D P f f A t my U ty f M ryl d Sch l f M d i e w th th ta f *D W tt T H nte* M D I tru t *A* tomy llus trat d by *W ll m E Lo b l* M dic l Art t th Depa tment f Anatomy 206 p g 82 llu trat on J B L pp tt C Ph lad lph P p bl h 1953 P $10

Sl pp d Cap t l F m nal Ep phy by *Arm Kl n* M D R b t J *J pl* M D *J h A R dy* M D *d J eph Ha l* M D M h tt G r l Ho p t l B t M Am r L t S P bl cat Numb 153 A M gr ph Am L ur R g D gn d t d by *A b y O H mpt* M D Ch f D pa tm t of R d l gy Ga f eld M m al H p t l W h g on D C 130 p g ll tra d Ch l C Th m P bl h Spr ngf ld Ill 1953 P $6 75

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I h l ti Th apy d R e tation by *M y r S kl d* M D D c D p rtm t f A the l gy Rh d Isl d H p t l P ov d c R I Am L S r P bl c t Numb 156 A M graph n th B ton D ion of Am L tur An th d d by *J h Ad a* M D D t D partm f A th Ch ty H p tal N w O l La 343 pag llustr t d Charl C Th m P bl h Sp gf ld Ill 1953 P $7 50

Op ra S g ry \ l me I d II by *Guy W H l y* B S M D F A C S A oc P f or f Surg y M d l C ll g f V g n A d g Surg on St El b th H p t l R hm d V and J A B gg M D F A C S P f f S g y \ dic l C ll g f V g S g Ch f M d l C ll g f V g H p l R hm d V 6h d t 1 579 p g ll t d by *H l L rr* Th C V M by C St L M 1953

Th R l f G w h H m Ca b hyd t M t b l m by *R C D Bod d M W S k //* D p e f Ph m l gy N w Y k U y C ll g f M d N w Y k N Y O g lly p bl h d th A n l f h f w Y k A d my f S V l me 57 Art l 2 p g 23 60 Th N w Y k A d my f S N w Y k N Y 1953 P $1

T t f th N w Y k A d my f S d d by *R y W ld M* S II V l 15 \ 7 May 1953 261 pag Th N w York A d my f S e B ltm Md 1953 P $0 60

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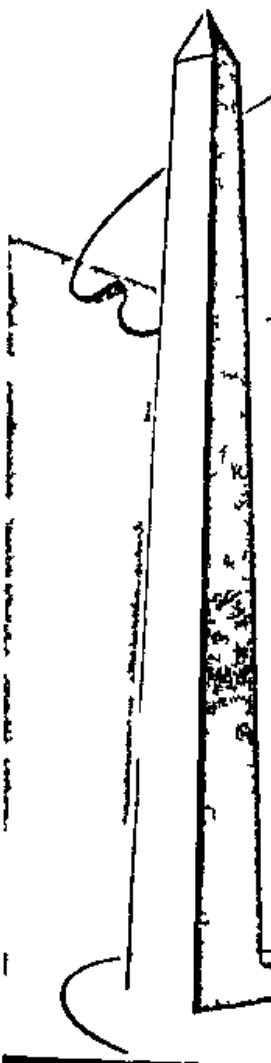
JEWETT V REA *Associate Editor*
Captain Medical Corps
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FOREWORD

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Monthly Message

During World War II one of the outstanding surgical accomplishments was in the care of chest wounds Specialist units of thoracic surgeons functioned in forward combat areas saving many lives as well as constantly improving technics in surgery of the chest Similarly during the Korean conflict the field of vascular surgery has advanced to the stage where specialist units of vascular surgeons have become an integral part of military surgical teams An important factor which has contributed to the improved results of treatment of injured blood vessels is the reduction of the time lag between wounding and operation This time element is dependent on two factors—speed of evacuation and the proximity and availability of the vascular team During the Korean conflict the man with a major blood vessel injury received surgical attention four hours earlier on an average than did his counterpart in World War II

More than 300 major arteries of the extremities injured in Korea were repaired Although it is too early for complete evaluation of these patients only about 30 have required the amputation of a limb The amputation incidence in World War II following surgical repair of major arteries was about 50 percent Improved methods in vascular surgery have probably saved some 125 limbs which would have been lost had technics of World War II been used

In great part this advancement in military medicine has been due to continued research based on experiences of World War II and the Korean conflict which has resulted in the application of a technic which reconstructs an injured blood vessel in continuity

With the standardization of the armored vest for the combat soldier and marine fewer are killed but it has resulted in a marked increase in the number and gravity of wounds of the extremities Under these changing circumstances the application of reparative surgery to torn blood vessels assumes ever increasing significance in the rehabilitation of the wounded

Melvin A Casberg M D
Assistant Secretary of Defense
(Health and Medical)

THE HOSPITAL ADMINISTRATOR AND COMMUNITY RELATIONSHIPS

PAUL L. FOSDICK *Brooke General, MC, USA*

COMMUNITY relationship is something we have whether or not we want it. Our relationship with the public reflects what we are not what we say we are. Community relationships are everybody's business. A hospital commander's problem is not solved by the presence of a public relations man who may define and defend community relationships but he cannot create it. Community relationships are simply the reflections of the leadership and actions of management. The public relations expert should analyze what people will think, keep management advised and prepare plans, but serve in the background.

KEEP EMPLOYEES INFORMED

Relationships in the community reflect our form of Government. In a democracy the people rule. Therefore in our community relationships everyone must participate. A sense of pride must somehow be instilled in every employee every patient every officer and enlisted person. In their daily conversations with their neighbors at their churches in their clubs they must be proud to say the work at your hospital. They must have some unusual but fine incident they can relate which reflects favorably on their institution. They must be able to tell how busy they are because of the duties that have fallen on them. It is well if the work is competitive for them with a chance to win a certificate or a commendation. They all must be well informed of what is going on in the hospital. When an unusual lifesaving procedure has been performed everyone should know about it and feel that somehow they contributed to this feat. For a large hospital, a weekly newspaper which is distributed free of charge within the hospital does much to create this impression. For those who win awards or promotions photographs on the bulletin boards serve to further reward the individual and stimulate others to try for a like recognition. Periodic messages of a general nature from the administrator or commander emphasizing the importance of some accomplishment or some goal or aim serve to get everyone in on the act. This can be done by a general conference or in writing

From Fitzsimons Army Hospital, Denver, Colo. Presented at the 44th Institute for Federal Hospital Administrators, National Naval Medical Center, Bethesda, Md., 27 Jan. 19

through appropriate media It can sometimes be done in a subtle but more effective manner by its incorporation in a news item In short it is important that management keep employees well informed

If your mission has been changed or if your funds have been curtailed so that a reduction in force is necessary your plan for effecting the change should be immediately announced so that everyone can begin to plan This should be done even though you know that alterations may have to be made in your plan but you should also publish these alterations as promptly as they are formulated Management must take careful cognizance of suggestions made by employees This gives everyone a chance to be heard and the action is accomplished with much less resentment It is well to have suggestion boxes and a committee to consider every suggestion no matter how trite it may appear Good suggestions should be well rewarded All suggestions should be acknowledged by a polite and appreciative note Complaints must be heard in a tolerant atmosphere and sincere effort must be made to either correct or explain the underlying cause Complaints can be kept to a surprising low number if everyone is kept well informed day by day

PATIENT HOSPITAL CONTACTS

The patient is the other person whose thoughts and remarks will do much to determine what your community thinks of your institution He is the recipient of what you have to offer He really knows if you are what you say you are He meets family friends and acquaintances daily when he can be in a physical state which does not contribute to his desire to spread good public relations His first contact with the hospital therefore must engender confidence This contact may be the ambulance driver and attendants The patient does not expect too much of them but he does expect them to be concerned about his comfort and to recognize that he is ill He expects them to be reasonably gentle and he expects them to move him to the hospital in a reasonable length of time His next contact may be at the admitting office He is not resentful at giving certain personal information but he is most resentful if he is left uninterviewed for any appreciable length of time particularly if he can see the persons manning this office working on records or otherwise employed rather than caring for his immediate problem

His next contact is on the ward He expects everyone there to have immediate concern for him He is gratified if the nurse has his room or bed ready If he has to wait in the corridor he becomes unhappy and concerned regarding the efficiency of that unit He is in strange surroundings and he wants someone who will answer his questions without delay Whether the questions

are answered decisively or not does not matter But if he wants to know when he will have his x ray and if the nurse or attendant can say, "The doctor will see you this afternoon and determine that" or "The doctor says you are to rest two days before you go to x ray," he is satisfied If he is told, however, "I have no orders for you to go to x ray" or "You'll go to x ray if you need an x ray," he immediately builds up a subconscious doubt as to whether or not these people know what they are doing

DOCTOR PATIENT RELATIONSHIP

The doctor patient relationship also is most important The armed services, at present, are working under some handicap, in that many of the physicians are in military service involuntarily Occasionally the physician may transmit his dissatisfaction to the patient and the patient, in turn may feel antagonistic or sympathetic to the physician, either of which is not a correct relationship It is desirable that every patient feel that he is the most important patient the physician has and every utterance and action of the physician is for his benefit alone It is my belief that physicians in general, whether or not they are serving voluntarily, are interested in the welfare of patients and that they expend all their energies toward improving the lot of the patient

OCCUPATIONAL THERAPY

Long term patients require much more than professional care to become enthusiastic hospital rooters They may or may not have hobbies If they have particular tendencies toward writing, reading, inventing, furthering their education, or learning handiwork of any type, they must be given instruction or help In this connection, one of our chronically ill patients invented the "autronic eye" in use for the first time on 1953 automobiles He had the idea and part of the knowledge our educational units were able to get together the books, the materials the assistance necessary for him to carry on and the result was the purchase of his invention by General Motors The librarians, the occupational therapists, the educators the Red Cross workers all have a monumental task in satisfying the whims, the desires and the ambitions of patients The actions of these groups contribute a great deal to the public relations of your hospital It is a great source of satisfaction to sign from 10 to 20 letters of congratulations per month to patients because they have completed some phase of an educational program Some finish grade school some high school and some gain college credits, but the important thing is that every one of them has done something useful and beneficial for himself about which he can be proud and concerning which he can boast

EXTERNAL FACTORS

All of this is what we can do internally This is the core of the community relationship problem because those within the hospital know what your hospital really is regardless of what the newspapers the radio and other media say it is But external relationships are also important the first of these being your information office Visitors to patients prospective patients contractors bidders employee applicants in fact everyone who comes into your hospital is entitled to prompt centralized and personalized information The information clerk is one of the most important members of the staff and his principal asset is a pleasant personality He or she cannot be expected to know all the answers but apathy or lack of interest or unpleasantness cannot be tolerated in an information office If the information office is located some distance from the entrance to the reservation or hospital a convenient method to follow to reach it is most important Follow the yellow line or some such device Administrators would do well personally to select their information personnel if they desire to link this important asset to their community relationship

Some communities are easy to enter others more difficult but every community has some event where if nothing more they need scenery They need someone in a uniform or some federal official to add to the dignity of the occasion By all means go Before long you will have met some of the prominent citizens in all walks of the community You may be asked for a golf game a hunting trip a duck shoot—accept and go You may want to ask someone for an occasion at your hospital By all means do so See to it that the mayor the chief of police the chairman of the school board know something of your hospital and its problems Soon you will be asked to speak at some luncheon club Do so but keep your remarks strictly within the time limit compliment their organization on whatever it is trying to do Never fail to plug the importance of your own organization and by all means stick absolutely to the facts If you are speaking to an organization of business men talk about your hospital as a business if to a group of educators discuss what you are doing along educational line Remember that everyone is interested in what you are doing with regard to healing the sick In an amazingly short time you will have a speaking acquaintance with civic leaders rotarians members of the chamber of commerce the newspaper editors the entertainer control groups Kiwanians Optimists Toastmasters and even technical organizations

You will have requests for patients to appear at various affairs Intelligent patients who will make intelligent remarks should be selected One never knows when they will be asked to make remarks

You are less likely to have difficulty with the professional societies It is highly important that good relationships be maintained with all of them Having a meeting of the medical society the dental society, the laboratory technicians, or the hospital administrators at your institution once a year is not a difficult task In some instances this meeting is the big meeting of the year—it is anticipated by the members It is always wise to have something unusual but good on your program so that a doctor attending can say that he saw this work at your hospital

Physicians dentists, and others on your staff should be encouraged to speak to professional groups both in the community and elsewhere They should prepare their data carefully and should present the subject matter competently

In any community there are always demands for speakers on general subjects In any organization there are always a few who like to speak These should be made known to the public relations man so he can co-ordinate the speakers and the request

One other item of importance in community relationships is the prompt and polite answering of correspondence Everyone is entitled to have an answer to any question he may have Although he may be greatly dissatisfied, a prompt forthright reply will do much to place him on your side in the future

SUMMARY

Community relationships are with us whether we want them or not To make them good rather than bad is our goal Our public relations expert can give us technical guidance Many times he can tell us what to do and when why and how Community relationships depend upon the actions of management because they are a direct reflection of what our institution is rather than what anyone may say it is We must work both internally and externally to accomplish a good community relationship goal We must do more than the minimum in the community We must go beyond what the people expect A good simple rule is to be sure all of the actions of management are in good taste, that they are handled with good temper and that effort is always made to put forth good talent

COMPROMISE TREATMENT OF SEVERE MALOCCLUSION IN ADULTS

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SEVERE dental malocclusion frequently has been observed in military personnel Although they have a sufficient number of teeth for satisfactory mastication of the usual ration their malocclusion is such that it would appear that masticatory efficiency is at a minimum The rationale of treatment and a review of the corrective procedure in several patients is reported

The optimum time for correction of dental malocclusion is in the young person prior to the attainment of complete appositional growth of the jaws If a patient with a malocclusion is not treated until after major growth has taken place the dentist can no longer depend on moulding or redirecting the formation of the jaws In such instances the treatment must often be a compromise between the facilities available the status of the dentition and the ideal occlusion

There are a number of approaches to the correction of severe malocclusion in the adult The choice is dependent on the degree of the malocclusion the objective to be attained and the availability of time equipment and skilled personnel The patient must be considered with respect to the classification of his deformity the number condition and position of the remaining teeth the status of the supporting structures and the feasibility of correction The type of treatment used may be orthodontia surgical correction a prosthesis or selective grinding In many instances combinations of these are necessary to achieve a satisfactory result

The patients reported here were treated by selective grinding This method was chosen because of its relative simplicity combined with the degree of improvement which was possible It was a compromise because the basic malocclusion was not changed nor was there much improvement in esthetics Time consumption

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was minimal and the risk of an operation was not incurred In all instances, the end result was considered better than could have been obtained with a prosthetic appliance

Selective grinding, or equilibration of the dentition by grinding, is not a haphazard procedure in any sense It has specific objectives which the dentist must keep in mind as well as definite limitations which must be observed Even in a malocclusion, it is dangerous to assume that harm cannot be done by indiscriminate removal of tooth structure Unless great care is exercised, patients treatable by conservative methods can develop complications by the well intended but misdirected efforts of the dentist.

OBJECTIVES FOR EQUILIBRATION PROCEDURE

Schuyler[1] presented an excellent outline of the objectives for the equilibration procedure These are to (1) correlate centric occlusion with an unstrained centric maxillomandibular relation, (2) obtain maximum distribution of occlusal stress in centric maxillomandibular relation, (3) retain the maxillomandibular opening, (4) equilibrate the steepness of similar tooth inclines, thereby distributing eccentric occlusal stress, (5) establish smoothness of guiding tooth inclines (6) reduce the incline of guiding tooth surfaces so that occlusal stresses may be more favorably applied to supporting tissues (7) retain the sharpness of cutting cusps, (8) increase the food exits and (9) decrease the contact surfaces These objectives as well as a technic for equilibration of the human dentition have been discussed in another article [2] Some variations occur in treating patients with severe malocclusion as compared to the management of the usual case of traumatogenic occlusion

MALOCCLUSIONS TREATED

Maxillomandibular opening The treatment for an open bite requires a reduction of its vertical dimension in order to bring the anterior teeth into a functional relationship This may be done by reducing the height of the posterior teeth or, in extreme instances, by removing several posterior teeth and replacing them with an adequate prosthetic appliance Occasionally, it is necessary to increase the length of the anterior teeth with veneer or jacket crowns in addition to reducing the vertical dimension Because the routine equilibration procedure should not reduce the vertical dimension, treatment of an open bite calls for a radical departure from the measures ordinarily followed to prevent closing the bite

Overbite and overjet In an open bite, the effort is to establish an incising bite If the lower anterior teeth are posterior to the upper teeth, the bite should be closed until incisal contact

is established in the protrusive excursion of the mandible In some instances it is prudent to compromise for good function in one lateral movement only rather than to try to provide incisor contact with both lateral and protrusive movements Patients with an anterior cross bite also require a compromise When the lower anterior teeth are located anterior to the upper teeth while the mandible is in its centric position the dentist usually cannot hope to establish function in the anterior segment An exception to this can be brought about by removing some teeth and establishing functional contact by the insertion of a prosthetic appliance In the absence of such extensive measures incisive function may be established in one or both cuspid areas In patients with a moderate anterior cross bite an end to-end contact can often be established for the anterior teeth because the patient usually has an acquired centric position Often the premature contact is caused by the anterior teeth

Posterior cross bite The usual way for recontouring the teeth to establish lateral excursions is by grinding the buccal cusps of the upper teeth and the lingual cusps of the lower teeth In cross bite relationships this must be reversed The lingual cusps of the upper teeth and the buccal cusps of the lower teeth should be recontoured to provide the smooth lateral excursions The principle of providing opposing incline-plane contact for the centric position remains the same but the distribution is slightly altered because the lingual cusps of the lower teeth occlude along the sulci of the upper teeth

Posterior end to end contact Occasionally the majority or all of the posterior teeth are so placed that only the cusp apexes contact in the centric position In such instances not only is the centric position difficult to establish but the lateral movements are ill defined because there is no opening movement with the lateral excursion In these instances the dentist should endeavor to close the bite sufficiently to create some degree of interdigitation of the teeth for a definite centric position From this position inclines can be formed which will provide the vertical opening during the lateral movements The extent to which these two objectives may be attained will vary greatly but the dentist should not be satisfied until enough interdigitation is secured to provide a definite centric position

Reverse compensating curve As the bite is closed in the presence of a reverse compensating curve, or curve of Spee the grinding should be directed to reducing the reverse curve toward a more normal relationship This is accomplished by recontouring the last upper molar more extensively than the last lower molar The next molars receive more nearly equal attention while the upper first molars or bicuspids are passed over at the expense of the opposing lower teeth In this manner, a compensating curve

may be established, or at least enough of the reverse curve may be eliminated to permit anterior contact during the protrusive movement of the mandible

OUTLINE FOR EQUILIBRATION

The most important aspect of correcting malocclusion or traumatogenic occlusion is to be able to visualize the final result before grinding is started It is easy to become disoriented after grinding has progressed Strict adherence to the treatment outlined and completion of one step before passing on to the next is essential otherwise a satisfactory occlusion will be unlikely A convenient routine for equilibration is

1 Determine the path toward the true centric position by observation of the mandibular movement, palpation, auscultation,[3] and the use of articulating paper

2 Locate the first premature contacts in the path toward true centric position

3 Remove the premature contacts keeping in mind the need for conserving tooth structure for final occlusal contact Deepen a sulcus if more interdigitation is desired or reduce a cusp if less interdigitation is indicated

4 Repeat steps two and three until the marks indicating centric contact are properly distributed and the centric position is stable with the desired vertical dimension established Inclined-plane contacts should be balanced so that the resulting vector of force will be directed along the long axis of each tooth

5 Establish smooth lateral excursions by adjusting the teeth for one working bite first and then its balancing bite without interfering with the centric contacts Proceed to the opposite working bite followed by its balancing bite

6 Adjust the protrusive excursion If the cusp inclines have been adjusted properly and the compensating curve has been established there should be little recontouring necessary to provide functional contact of the incisors but if the malocclusion is so severe as to make incisor function impossible, the cuspid areas should be adjusted to provide an incising bite

7 Smooth and polish all roughened surfaces, being careful to avoid altering the centric contact areas

CASE REPORTS

Case 1 A 31 year old man was seen for dental evaluation because of the possibility that his masticatory inefficiency was contributing to vague stomach complaints Several years prior to admission, his upper anterior teeth apparently hypoplastic, had been removed in order to improve his appearance and to provide

better function The prosthesis failed to satisfy either objective The patient did not feel that his deformity was progressive nor was he particularly disturbed by the fact that he was forced to swallow food with little chewing He avoided fibrous foods and tough meats as much as possible On several occasions he had been told that all of his upper teeth should be removed and replaced by a denture for better appearance and function He was reluctant to accept that solution for his problem

Dental examination revealed an Angle class III malocclusion (fig 1A) with an open bite anteriorly and a cross bite posteriorly The upper right second and third molars presented minimal occlusal contact with the lower right second and third molars The upper left second and third molars occluded with the lower left third molar His other teeth were not functional in any position of the mandible The upper right and left first molars and the lower anterior teeth were hypoplastic



Figure 1 (Case 1) (A) Before treatment (B) After treatment

Selective grinding or equilibration was completed with the vertical dimension reduced to permit an end-to-end incisor relationship The degree of occlusal contact was increased and smooth balanced lateral excursions were provided for the cross bite relationship (fig 1B)

Case 2 A 20 year old man was seen for routine dental examination His only complaint was difficulty in masticating some foods Some recontouring had been done on the anterior teeth several years prior to this examination but no attempt had been made to provide better function

The patient was found to have an Angle class III malocclusion (fig 2A) with bilateral posterior cross bite and an open anterior segment The lower third molars the lower left second molar and the upper right third molar were missing The occlusal surfaces of the remaining posterior teeth were from moderately to extensively worn

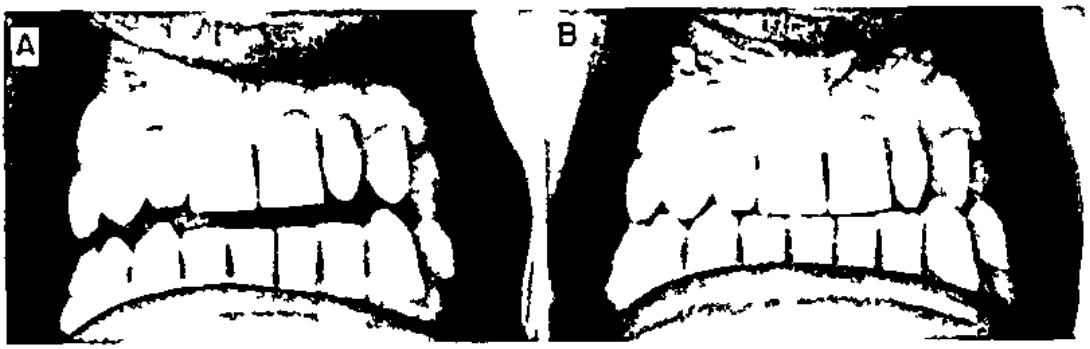


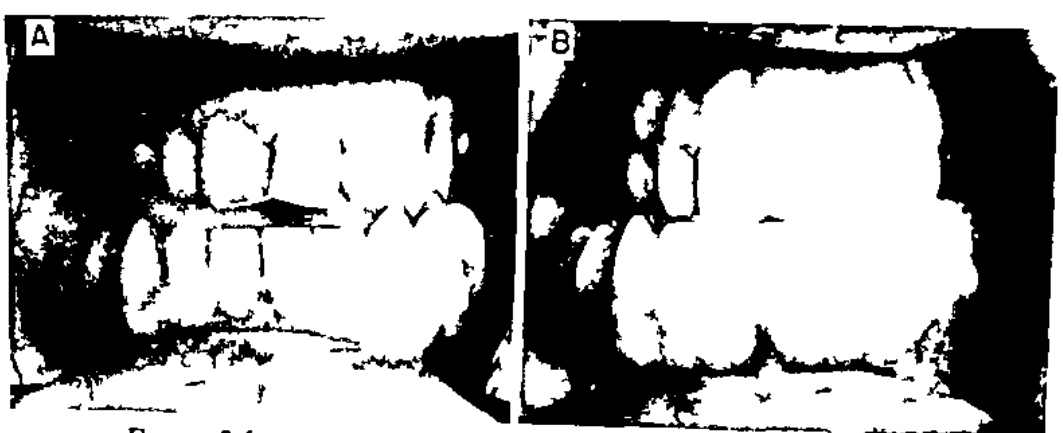
Figure 2 (case 2) (A) *Before treatment* (B) *After treatment*

Selective grinding was done with the degree of closure of the bite limited by the relative thinness of the enamel remaining on the posterior teeth An end to-end anterior relationship (fig 2B) was achieved with balanced cross bite function established for the posterior teeth

Case 3 A 20-year old man was seen for dental evaluation following his complaint of being unable to masticate the usual ration Prior to his entry into the military service, the patient had lived at home where the food was prepared to his particular requirements Although the patient was slightly obese, he insisted that he had great difficulty masticating sufficient food in his present environment, in spite of the fact that the deformity was not increasing in severity He had been urged to have all teeth removed and replaced by subsequent prosthesis in order to provide greater masticatory efficiency

Dental examination revealed a severe Angle class III relation ship with only the third molars and the left second molars in centric contact There was an anterior open bite (fig 3A) and bilateral posterior cross bite All first molars and the lower right second molar were missing The mandible was massive in appearance and the tongue seemed larger than normal

With the mandible in centric position, only the left posterior teeth were functional There was no possibility of decreasing



F gure 3 (case 3) (A) *Before t eatment* (B) *After treatment*

the anteroposterior space in the anterior region nor could the bicuspids on the right side be considered potentially functional Accordingly, centric balance was established by the contact of the right third molars and the bite was closed sufficiently to create function in the left posterior region The left cuspid area was adjusted to provide an incising bite with a right lateral excursion of the mandible (fig 3B)

Case 4 A 19 year old man was seen for dental evaluation following a recommendation that all his teeth be removed because of severe malocclusion and pyorrhea He had no complaints and his history was noncontributory

Examination revealed an Angle class III malocclusion with a left posterior cross bite and an acquired centric position The anterior teeth presented premature contacts (fig 4A) There was no tooth mobility Radiographically the alveolar bone the alveolar crests and the lamina durae throughout the mouth ap

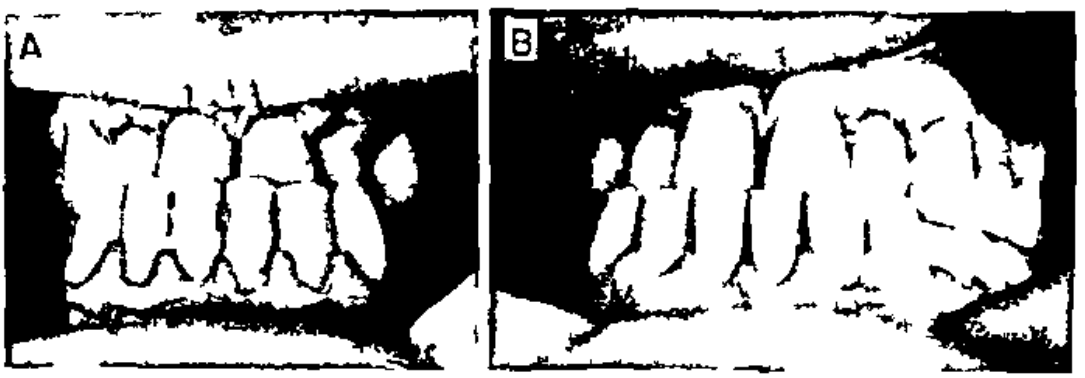


Figure 4 (Case 4) (A) Before treatment (B) After treatment

peared normal Mouth hygiene was very poor with resultant heavy calculus formation and marginal gingivitis

This patient was treated by removal of local irritants and selective grinding to establish a stable true centric occlusion and smooth lateral excursions When the true centric position was established the anterior teeth were in a functional end to-end relationship (fig 4B) Satisfactory equilibration of both centric and lateral movements was secured in spite of the uni lateral cross bite relationship The vertical dimension appeared to have been increased slightly with the newly established occlusal contacts

DISCUSSION

In the dental requirements established for selective service (AR 40-115) malocclusion is no longer a factor in the acceptance or rejection of personnel for military service Many persons with more than moderate malocclusion are accepted into the services

Most had been told by civilian as well as military dentists that the only solution to their malocclusion was a full mouth extraction, and replacement by full dentures, or the acceptance of their condition as permanent and unremediable

Operative procedures and extensive prosthetic replacements are both risks in value and take time Because such dental surgery is elective for a condition that existed prior to induction, failure could involve the Government for many years of professional and monetary responsibility Such patients are all aware of their condition and desire that something be done As has been shown in these four patients, excellent functional and esthetic results may be obtained without drastic surgery and extensive prosthesis

The age group of these made the proposal of full mouth or multiple extractions unacceptable to them By the judicious use of selective grinding and equilibration, excellent end results were obtained The patients were not subjected to prolonged uncomfortable treatment of a severe nature They were kept from their training a minimum amount of time and were not incapacitated to a greater extent than they were normally accustomed to in masticating the issued ration

This type of care has a definite place in the dental treatment rendered by the military dental services It accomplishes much for a patient without a great loss of time or by incurring the liability of the Government for future claims Potential liability is most important in the elective treatment of conditions existing prior to entry into military service

SUMMARY

The treatment of four adults with malocclusion is significant because (1) corrective procedures were not initiated early and (2) it demonstrates the degree of benefit that can be secured from the simple but exacting selective grinding technic Although the corrective procedure is completed with a minimum expenditure of time, it is an irreversible procedure and requires careful evaluation prior to its initiation as well as precise operating technic in its execution

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A NEW ANTICOAGULANT FOR ROUTINE LABORATORY PROCEDURES

A Comparative Study

CLAUDE H SCHMIDT *F t L t t MSC USAR*
MELICENT E HANE *B S*
DORIS C GOMEZ *B S*

THE disodium salt of ethylenediaminetetraacetic acid hereafter referred to as FDTA (sequestrene disodium versenate) was first investigated in Germany by Dyclerhoff et al This compound exhibited an anticoagulant action in vitro but not in vivo Apparently anticoagulation is due to the binding of calcium ions to the agent. The properties of this anticoagulant were recently studied further by Proescher who found that it was a better blood preservative than sodium citrate or potassium oxalate Small quantities (from 0 005 to 0 01 ml of a 10 percent aqueous solution) will keep 5 ml of blood from coagulating

The effect of FDTA on nine routine blood chemistry tests and its suitability for general hematologic procedures have been investigated and are presented in this report

METHODS

Blood from normal donors and patients with tuberculosis was used in this study

Hematologic studies The effects of three anticoagulants on the packed cell volume the white cell count and the leukocyte morphology were studied Five milliliters of freshly drawn blood were placed in five kahn tubes each containing one of the following (a) 0 1 ml of a 1 percent heparin solution (b) 0 03 ml of a 10 percent EDTA solution (c) 0 1 ml of a 10 percent EDTA solution (d) 2 mg of powdered EDTA (e) double salt of potassium and ammonium oxalate 0 5 ml of the solution dried at 60 C The packed cell volume of these specimens was determined in Wintrobe tubes 1 24 48 and 60 hours later White cell counts and stained films were made 1 6 and 24 hours after drawing the blood Leukocyte morphology and other features of the blood

F om F tr m ns A my H p tal D Col

smears were studied by the "buffy coat technic as described by Beerman [3] Between determinations all samples were kept in the refrigerator at 4° C

Chemical studies The comparative effects of two commonly used anticoagulants and EDTA on the performance and results of nine routine chemical tests were investigated The anticoagulants used were 0 15 ml of a 1 percent heparin solution 0 15 ml of a 20 percent potassium oxalate solution, and 0 15 ml of a 10 percent EDTA solution, each per 10 ml sample of blood The efficacy of each of the three anticoagulants on each of the nine chemical determinations studied was repeated on an average of eight separate blood samples Tests for the following were performed sodium and potassium, using the Baird flame photometer[4] with lithium internal standard, chlorides, both the iodometric[5] and mercuric nitrate methods [6] creatinine,[7] uric acid,[8] inorganic phosphates [9] blood urea nitrogen,[10] blood sugar,[8] and plasma bicarbonate by the titration method [11] After the introduction of the anticoagulants the preliminary handling of all samples was identical

RESULTS

Packed cell volume The heparin and EDTA tubes agreed very closely, within 1 percent, both at 1 and 24 hours No difference was noted among the three concentrations of EDTA which were employed The potassium oxalate tubes demonstrated from 2 to 5 percent variation from the heparin tubes, and always showed an increase in packed cell volume after 24 hours Varying degrees of hemolysis were evident in the potassium oxalate tubes This condition was also present in the heparin tubes, though to a much lesser degree, while the EDTA tubes showed almost no hemolysis after 24 hours

The buffy coats in the EDTA tubes appeared intact as did the platelet layers Both were less distinct in the heparin tubes and were almost indiscernible in potassium oxalate This condition was even more pronounced after 24 hours

Stained films The observations based on the microscopic examination of slides prepared identically are summarized in table 1 Observation of the three EDTA preparations are presented as one, because no difference in morphology resulted from the three concentrations employed The cells preserved with EDTA appeared smaller in size as compared with oxalate preserved cells Many shrunken white cells were seen in the heparin preparation The staining characteristics of the EDTA preparations were far superior to the other two

TABLE 1 *Th // t of th t oag l t bl od m m ph l gy*

Ob t	T m l (h ur)	A t oag l t		
		P t m l t	H p	EDTA
A ly f ll le (p lym ph cl ocyt d lymphocy e)	1	+	+	–
	6			
	24	+		
Cla cy of morph logy	1		+	
	6			
	24			
Qua y f pl l t	1		++	++
	6			+
	24			+
S b l y	1		+	+
	6			
	24			+

C ll d or d nd poorly p rv d
C ll y h y

TABLE 2 *Th // t f thr t g f t o the uh t ll co t*
(P g h g a 24 h p od)

A oag l t	Ch g l h ur (pe e t)	Ch g l 6 h (pe nt)	Ch g l 24 h (p c t)
P m l		1 4	25 1
H p	4 3	33 3	43 0
EDTA ( ) 0 03 ml f 10 p l t	1 2	4 8	17 0
(b) 0 10 ml f 10 pe l	1	4 9	9 3

U d ta d d

TABLE 3 *Effect of th ee anticoagula ts on ni e chemical procedures showing mean and mean deviation*

Chem cal determ nations	Potassium oxalate (Mg %)	Heparin (Mg %)	EDTA (Mg %)	Serum (mEq /L)
C eatini e	1 15 ± 0 06	1 25 ± 0 06	1 24 ± 0 05	
Blood urea nitrogen	16 2 ± 0 9	16 2 ± 1 1	16 0 ± 1 0	
Gl cose	126 0 ± 12 0	125 0 12 0	124 0 ± 9 0	
Pho phor s	3 3 ± 0 2	3 4 ± 0 2	3 3 ± 0 2	
Uric acid	4 3 ± 0 3	3 9 ± 0 5	4 3 ± 1 0	
	(mEq /L)	(mEq /L)	(mEq /L)	
Sodium	128 4 ± 5 2	143 7 ± 2 1	155 1 ± 3 1	143 6 ± 1 8
Potas i m	Not te ted	4 2 ± 0 3	4 3 ± 0 4	4 8 0 2
Chlorid (todometric titration)	106 6 ± 0 8	108 6 ± 1 3	101 9 ± 2 5	107 7 ± 1 8
Chlorides (Schales & Schales)	108 1 ± 3 5	112 4 ± 2 6	118 6 ± 3 0	112 0 ± 3 5
Plasma bicarb nate (titration method)	27 4 ± 1 0	28 3 ± 1 5	21 8 ± 1 2	

White cell counts Over 160 white cell counts were performed. The differences between the three anticoagulant preparations are shown in table 2 Within an hour after drawing the blood there was very little difference in the effects of the three compounds on the cell count After six hours a rather large drop in the white cell count occurred in the heparin preparation This condition was even more pronounced after 24 hours at which time the count had decreased by 50 percent in many instances and the cells had a tendency toward clumping in the counting chambers The decrease in white cell count after a 24 hour period was very much less with EDTA and potassium oxalate

In order to estimate the accuracy of the counting technic a series of 10 counts was performed on the same blood sample the mean difference between counts was 360 which is equivalent to a 5 0 percent error in this series of counts The same person read all the counts in this study so as to keep variation of technic to a minimum

Blood chemistry tests A comparison of the effects of three anticoagulants on certain blood chemistries is shown in table 3 No difference was seen in creatinine levels when heparin and EDTA were used a slight drop was noted with potassium oxalate No variation was observed in the blood urea nitrogens with any of the anticoagulants The results of the blood glucose determinations were within 1 percent of each other The mean values were high because the blood specimens were from non fasting patients No significant difference was noted among the phosphorous determinations A small variation was noted in the blood uric acid test the levels of the heparinized samples being slightly lower than those of the other two agents Using a serum control in the sodium and potassium determinations revealed large inconsistencies the levels in the heparinized samples being comparable to those in the serum while the levels in the EDTA samples were high and those in the potassium oxalate samples were very low The oxalate preparations were not tested for potassium

Some variation was seen in the results of the blood chloride determinations With the iodometric method the EDTA treated samples were low and with the mercuric method of Schales and Schales the results were invariably high In the latter procedure most of the increase was accounted for by testing the EDTA solution alone this averaged 7 2 mEq /L of chlorides The low results obtained with EDTA in the iodometric method cannot be explained Good agreement was seen in both methods between the heparinized plasma and the serum sample Fair agreement was seen between the results obtained with potassium oxalate and heparin in the plasma bicarbonate procedure No reason can be given for the low results obtained with EDTA

DISCUSSION

EDTA appeared superior to heparin and potassium oxalate as an anticoagulant for the routine hematologic procedures of packed cell volume determination, white cell count, and blood smear morphology This superiority is manifested in the observations presented in tables 1 and 2 Our data on packed cell volumes substantiated the work of Wittgenstein [12] If the hematologic examinations can be done within an hour of drawing the blood, potassium oxalate is nearly as good as EDTA If the examinations must be delayed as much as 6 hours, then EDTA is preferable to potassium oxalate Heparin should not be used as an anticoagulant in this type of work

In evaluating the merits of EDTA for use as an anticoagulant for blood chemistries, one should remember that the compound contains two atoms of sodium and has powerful binding properties The sodium in the compound accounts for the difference between the heparin and the EDTA determinations in the blood sodium levels It is difficult to explain the low sodium level when potassium oxalate is employed

Excellent agreement was obtained with all three anticoagulants in a number of chemical tests creatinine, blood urea nitrogen, blood glucose, phosphorus, and uric acid In the potassium determination, the results obtained with heparin and EDTA were similar

The chloride results are more difficult to interpret Using the Schales and Schales method, the heparin and potassium oxalate readings were very similar, whereas the EDTA reading was always higher EDTA solution alone gave a sizable reading with this method but with the iodometric method the EDTA results were consistently low and potassium oxalate was slightly lower than heparin

On the basis of cost, EDTA is far more economical than heparin In relative concentration, heparin costs about 160 times more than EDTA which in turn costs five times as much as potassium oxalate

SUMMARY

EDTA is superior to heparin or potassium oxalate in preserving the formed elements of the blood for hematologic examination in the laboratory It is much more economical than heparin but more expensive than potassium oxalate It does not require refrigeration EDTA may be used for a number of blood chemistry determinations

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The p ychiatri t of tod y is expected to be n oracle of wisdom who sit on high judging and prognosticating not only the interpersonal tr nds of man s el tio ship but also the political socioecon mic ed c tional cr m nal and forensic a pects of his behav or This has come bout largely because of the progress ve ncursi s that tl knowledge of modern psychology has made on man s variable inte ests in civilizat on The respons bilities involved for the psychiatrist in dealing with these soci l problems p esume on his capacity for ap plyi g exact methodologies to problems of group or mass as for in d v dual psychology The o erwhelm ng current problems of divo ce raci l pr judice and democracy are ch llenge that daily f ce the psy chiatri t though scie tif cally he may not be ready for them But in time he sh ll have g rded his loins a d met these social challenges just he has been meet ng the ch llenge of individual personality

—S ROTHENBERG M D
n *Journal of Ne vous a d Mental Disease*

PSYCHIATRY IN THE KOREAN CAMPAIGN

A Historical Review (1)

ALBERT J GLASS *Colonel MC USA (2)*

AS the Korean campaign progressed, constant changes in the administration of the psychiatric support of the troops were necessary

THE CHINESE COMMUNIST OFFENSIVE 28 November 1950 to 15 January 1951

On 25 November 1950, the Eighth Army began an all out offensive in the western sector of the north Korean front to coordinate with the attack of the X Corps in the east in an effort to reach the Yalu River and quickly end the campaign The Eighth Army attack proceeded unopposed for almost 2 days On the night of 26-27 November, several fresh Chinese Communist armies counterattacked all along the line, with a major thrust at the right flank of the Eighth Army, then composed of a ROK Corps The ROK troops rapidly collapsed, exposing the flank and rear of the 2d Infantry Division and the Turkish Brigade The position of the other units of the Eighth Army was untenable and they promptly withdrew to the Pyongyang area to avoid envelopment The 2d Infantry Division and the Turkish Brigade were forced to fight their way out of entrapment during which enemy roadblocks and flank attacks caused disorganization and produced heavy casualties

During this withdrawal, divisional medical support was necessarily restricted to emergency care and evacuation The holding of any patient for intradivisional treatment was impossible and impractical Even meager medical support was difficult to accomplish in the 2d Infantry Division because 5 of their medical officers were lost in the retreat Despite the large number of battle casualties, there were relatively few psychiatric casualties These were evacuated to Army medical facilities Intradivisional psychiatric treatment did not become operative until early in December, when the evacuation of Pyongyang was completed and stabilized defensive positions

(1) Th c d f tw i stallm t
(2) Br ok Army M d al C nt Fort Sam H ust T x

along the 38th parallel were established For several weeks thereafter the enemy contact was slight and serious fighting was not resumed until late in December

The 2d Infantry Division was placed in army reserve for rest retraining and absorption of replacements

Similar massive Chinese Communist assaults in northeast Korea forced the withdrawal of the X Corps In the mountainous Chosin Reservoir district the 1st Marine Division and elements of the 7th Infantry Division were forced to fight their way out of encirclement Their almost continuous 10 day battle to reach safety included the air evacuation of thousands of injured and wounded men from improvised rapidly constructed airfields severe physical deprivations intense cold and overwhelming numerical superiority of the enemy who attacked from all sides Despite the large number of wounded injured and frostbitten patients there were relatively few psychiatric casualties Here again was a situation where there was little or no obvious gain in psychiatric illness Plane evacuation was uncertain and used mainly for the physically disabled all others had to fight their way out in a do-or die manner

On 9 December a relief column mainly composed of 3d Infantry Division and Marine elements reached the retreating column By 11 December all U N troops had withdrawn to the coastal plain within the perimeter defenses of the X Corps There followed a gradual evacuation by sea as the defensive perimeter mainly manned by the 3d Infantry Division strongly supported by the guns and planes of naval vessels standing off shore was progressively narrowed Total evacuation was completed on 24 December The X Corps troops were brought into southern Korea where they became an organic part of the Eighth Army

Offensive Renewed

The end of December saw a renewal of the Communist offensive against the insecure defense line of the Eighth Army along the 38th parallel The U N troops resumed their orderly withdrawal and by 4 January 1951 the enemy recaptured Seoul By 7 January the Eighth Army had withdrawn to a line along the general level of Pyangtek in the west and Wonju in the center Here stubborn resistance was offered to further enemy advances At Wonju early in January the 2d Infantry Division with the attached French and Dutch Battalions made a firm stand against severe enemy onslaughts This successful defensive engagement marked the end of retreat for the Eighth Army as they consolidated a line of defense across the waist of South Korea

The lowered spirits of the troops was not reflected in the psychiatric rate, but rather in the increased amount of disease and number of nonbattle injuries, including self inflicted wounds The inclement weather caused respiratory and other infectious diseases and no doubt the numbing cold and icy roads were responsible for much frostbite and accidental injury, yet many psychiatric casualties were concealed among the numerous soldiers evacuated for subjective complaints and nondisabling conditions, particularly among the many allegedly frostbitten patients who had only subjective complaints and no objective findings This syndrome of cold feet was compounded out of the usual numbing sensation of the feet in cold weather a con scious or unconscious wish for the gain of illness, and poor motivation One can only speculate as to the greater vulnerability to frostbite of the potential psychiatric patient. It may be that the increased sympathetic stimulation, in such a fear ridden person, caused excessive vasoconstriction of the extremities with a consequent decrease in blood supply If this is a factor, it might account for the lessened incidence of psychiatric cas ualties noted at a time when frostbite casualties were so numer ous The increased incidence of self inflicted wounds was another expression of the loss of manpower for psychologic reasons Almost invariably it was explained by the person concerned as a combination of numbed fingers and carelessness The environmental conditions made it seem reasonable to ex pect many such unavoidable errors, yet the relatively innocuous character of most of the self inflicted wounds and their oc currence in safe rear positions, where there is no cause for haste, indicated the purposeful nature of the alleged accident. The increase of other types of accidental injuries tended to confirm the viewpoint that the dispirited and unhappy soldier may become apathetic to an injury that may possibly redound to his personal benefit and remove him from a traumatic environ ment In this vein, a signpost noted on a highway in Korea in May 1951 was quite apropos It read as follows "Never fear rotation is here accidents unnecessary drive carefully"

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In further considering the loss of manpower from psychologic causes it should be realized that relatively few men from United States troops were AWOL from battle This is in sharp contrast to the numerous instances of this overt reaction to fear and deprivation that occurred in the ETO in World War II There were simply no safe or comfortable places to go It was dangerous to leave one's unit and wander in the rear because of guerrilla activity and the weather The only escape from the hazards and discomforts of Korea was through medical channels

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You are less likely to have difficulty with the professional societies. It is highly important that good relationships be maintained with all of them. Having a meeting of the medical society, the dental society, the laboratory technicians, or the hospital administrators at your institution once a year is not a difficult task. In some instances this meeting is the big meeting of the year—it is anticipated by the members. It is always wise to have something unusual but good on your program so that a doctor attending can say that he saw this work at your hospital.

Physicians, dentists, and others on your staff should be encouraged to speak to professional groups both in the community and elsewhere. They should prepare their data carefully and should present the subject matter competently.

In any community there are always demands for speakers on general subjects. In any organization there are always a few who like to speak. These should be made known to the public relations man so he can co-ordinate the speakers and the request.

One other item of importance in community relationships is the prompt and polite answering of correspondence. Everyone is entitled to have an answer to any question he may have. Although he may be greatly dissatisfied, a prompt forthright reply will do much to place him on your side in the future.

SUMMARY

Community relationships are with us whether we want them or not. To make them good rather than bad is our goal. Our public relations expert can give us technical guidance. Many times he can tell us what to do and when, why and how. Community relationships depend upon the actions of management because they are a direct reflection of what our institution is rather than what anyone may say it is. We must work both internally and externally to accomplish a good community relationship goal. We must do more than the minimum in the community. We must go beyond what the people expect. A good simple rule is to be sure all of the actions of management are in good taste, that they are handled with good temper and that effort is always made to put forth good talent.

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(1) This document was written in 1954

(2) Brooke Army Medical Center Fort Sam Houston Texas

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It is for this reason that in December and January a more accurate indication of the manpower loss for psychologic causes can be found in the increased incidence of disease and injury rather than the relatively low psychiatric rate that reflected lessened enemy contact during that period

Army psychiatric facilities were prepared to support the divisional psychiatric program The previously mentioned plan of establishing a forward psychiatric center at the 64th Field Hospital in Pyongyang was implemented on 27 November Sufficient accommodations for 100 patients were made available in a building adjacent to the main hospital area The previous center at the 4th Field Hospital near Seoul remained in operation and the 8054th Evacuation Hospital in Pusan the most rear hospitalization point in the Eighth Army had a small psychiatric unit The X Corps sector in northeast Korea was served by the psychiatric section of the 121st Evacuation Hospital, supported by the psychiatric service of the hospital ship *Consolation*

Psychiatric Personnel Dispersed

Army psychiatric personnel were deliberately dispersed rather than concentrated in any one area or unit by assigning 1 or 2 psychiatrists to the various hospital units strategically located to receive most of the patients This arrangement served a dual purpose *First* it provided alternate treatment facilities in the event of the dislocation of forward centers due to serious battle reverses thereby insuring a continuation of Army psychiatric service particularly needed in any large withdrawal when intradivisional care is not feasible *Second* such a dispersion made it possible for psychiatric facilities to be adapted to air evacuation Most patients from the forward areas in the Korean campaign were evacuated by air This rendered difficult if not impossible the triage of psychiatric patients to any one area or hospital Whether patients were brought to this or that hospital depended on the weather the condition of landing strips the number of vacant beds and although rarely the desires of the flight crew For this reason it was necessary that psychiatric facilities be situated wherever large numbers of all types of patients were brought for treatment

As a result of the Communist offensive late in November thousands of wounded and sick patients poured into Pyongyang by plane train ambulance and truck Available medical facilities were rapidly over taxed forcing prompt re evacuation to medical units in the Inchon Seoul area and Pusan All psychiatric casualties were brought to the 64th Field Hospital Admissions of this type did not exceed 20 per day and were relative

ly few compared to the large number of wounded This was even more surprising because there was little prior screening by the division psychiatrists, who were on the move with their medical units Most of the psychiatric casualties were of the mild or moderate type, readily treated by physical restorative measures and superficial therapy Patients who could not be returned to combat were evacuated to the 4th Field Hospital for prompt disposition to noncombat duty The confused tactical situation about Pyongyang made limited duty assignment from this area impractical, except for some patients placed on duty temporarily with the medical detachment of the 64th Field Hospital, which was understaffed and desperately needed all possible help to perform their mission

When it became evident that our position in Pyongyang was untenable, the 64th Field Hospital prepared to close down and its psychiatric team moved to the 4th Field Hospital to form the main psychiatric unit in the Eighth Army The 4th Field Hospital also became the principal hospitalization center in Korea The hospital staff demonstrated energy and resourcefulness in rapidly improvising added facilities to receive the large influx of casualties Early in December the 4th Field Hospital had about 2 000 beds in operation and provided temporary quarters and messing for personnel of the 64th Field 171st Evacuation, and 10th Station Hospitals and nurses from 3 mobile surgical units The professional personnel from these hospitals participated in the treatment of the large patient load

Rapid Treatment Methods Used

Facilities and personnel were adequate to treat the daily average of 30 psychiatric admissions The effectiveness of treatment steadily improved The rapid treatment methods used by the psychiatrists helped orient their medical and surgical colleagues to adopt a similar management of mild illness and of those patients with only subjective complaints *(3)* As a result, from 150 to 200 patients of all types were daily returned to duty from the 4th Field Hospital

The large influx of casualties caused by the Chinese counter offensive again overflowed medical facilities in Japan As before, most of the evacuees were flown to southern Japan, where the 118th Station Hospital at Fukuoka functioned as an evacuation hospital, retained nontransportable patients for treatment and transferred the remainder by plane and train to hospitals in Tokyo and Osaka For a brief period in November and December, the 118th Station Hospital received *over 1 000* patients daily The capacity of the hospital was enlarged to

1 600 beds and a smoothly functioning medical and administra tive team that received treated fed and sorted thousands of patients during this hectic period was perfected

Early in December the 141st General Hospital was ordered to Camp Hakata 18 miles from Fukuoka in order to increase the medical facilities in southern Japan and lessen the burden on the 118th Station Hospital Their psychiatric service was in a strategic location to receive most of the psychiatric casualties evacuated from Korea Adequate facilities for 200 neuropsychi atric patients were set up in an area, separated from the main hospital that had sufficient space for an outdoor recreational program This plan became operative in the latter half of Decem ber By early January the psychiatric service of the 141st General Hospital had over 100 patients It became apparent that an electroshock therapy apparatus an EFG machine and more substantial closed ward facilities were needed for complete coverage in neurology and psychiatry in this region Steps were taken to realize such an objective

The 361st Station Hospital in Tokyo received most of the psychiatric casualties that arrived in Japan late in November and early in December At this time a number of recently ar rived psychiatrists were present at the 361st Station Hospital They included 5 young naval medical officers with civilian training in psychiatry and neurology Without exception they were receptive to material concerning the concepts and therapeu tic technics of combat psychiatry The available pool of new psychiatrists made possible the implementation of the previously described plan of decentralizing psychiatric facilities The assignment of psychiatrists to the various hospital centers was quickly reflected by a lower admission rate to the 361st Station Hospital Hospital commanders uniformly agreed that the medical service rendered by their units was improved

Two convalescent hospitals were established in Japan Both units one at Omiya 25 miles from Tokyo the other at Nara about 25 miles from Osaka began receiving patients on 9 December They were designed to relieve congestion in the major hospitalization centers by removing organically ill pa tients who required from 2 to 3 weeks of convalescent care before their return to duty This made available in the fixed hospitals hundreds of beds that were vitally needed for the in flux of fresh casualties who required active surgical or medical treatment

Use of Convalescent Units

From the psychiatric standpoint the opening of the convales cent units was an event of the first magnitude It made available

a realistic environment for psychiatric therapy which combated the vexing secondary gain in illness, unwittingly fostered by the comfortable atmosphere of the usual fixed hospital In contrast, the convalescent hospital put its patients in fatigue clothing and had a full daily program of calisthenics, marches, athletic activities, and training Patients under this regimen found little benefit in clinging to symptoms and were not adversely affected by suggestive evidence that evacuation to the United States was possible Psychiatric patients were deliberately dispersed among those recovering from organic disease who gave little support to their neurotic complaints The psychiatrist operating in such an environment found less resistance to psychotherapy as the patient turned more to the therapist for support and assistance *(4)*

One psychiatrist each was assigned to the Nara and Omiya Convalescent Hospitals and another to the 155th Station Hospital in Yokohama to reopen the psychiatric outpatient and consultation clinic that had been dormant since the 141st General Hospital had been transferred to southern Japan

The end of this period found psychiatric facilities in Japan well staffed and so distributed as to implement a full scale psychiatric program aimed at the outpatient and convalescent treatment of ambulatory nonpsychotic patients and at the inpatient care of psychotic and neurologic patients in 3 psychiatric centers, strategically located in major hospitalization areas

THE UNITED NATIONS WINTER OFFENSIVE
15 January to 22 April 1951

By 15 January, the momentum of the Communist attack had been reduced and the U N forces turned to aggressive patrolling On 21 January the U N operation (Operation Killer) of employing armored counterattacks, supported by infantry, air and artillery and designed to inflict a maximum number of enemy casualties with minimum losses to ourselves, was begun By the end of January our limited offensive had reached north of Suwon and Inchon In February, the U N offensive continued scoring gains against stubborn resistance, and by 14 February our troops had seized Inchon, Kimpo Air Field, and secured a line along the south bank of the Han River Vicious enemy delaying actions followed and these continued until the middle of March The Communists used road mines and dug in positions They destroyed bridges and demonstrated their ability to hold hills by repeated counterattacks Their resistance diminished by mid March and they withdrew, fighting only rear guard actions as our forces recaptured Seoul and pushed north toward the 38th parallel It was known that the Communists were building up a powerful reserve striking force Yet they offered only

sporadic resistance and by 8 April all enemy east of the Injin River had been driven out of South Korea Bitter opposition occurred thereafter particularly against our offensive moves in the central and eastern sectors

The winter offensive campaign caused an increase of our battle casualties and a consequent rise of the psychiatric rate which remained at this higher level through February March and April paralleling the aggressive U N tactics but the psychiatric rate never reached the level that could be expected from the uphill combat in such a bleak desolate frigid environment There were many reasons for the relatively low incidence of neuropsychiatric casualties The battle line was more secure with none of the rear infiltration and confusion that plagued our forces in previous periods of the Korean campaign Enemy positions and territory were methodically and carefully taken with an obvious regard for sparing the life of the infantrymen Operation Killer was well named and publicized as a procedure calculated to destroy the enemy with less emphasis on capturing ground The resurgence of morale was a remarkable phenomenon Defeatism was turned to grim determination and finally to aggressive confidence when it became apparent that concentrated fire power and carefully planned assaults could overcome the previously feared human wave tactics of the Communists An added factor was good medical discipline The experienced divisional medical officers had learned to appraise the subjective complaints of the unwilling soldier realistically and firmly closed the door of medical evacuation except to mentally or physically disabled patients Last but not least was rotation This most pertinent morale factor gave hope to the men that relief was possible The first rotatees left Korea on 18 April

The psychiatrists had consolidated and organized their functions within the divisions Aid stations were regularly visited and battalion surgeons indoctrinated as to their role in treatment and evaluation The division psychiatrists were consulted by line and administrative officers on matters of morale mental health and special personnel problems and gradually became emancipated from the restricted role of merely treatment and evaluation of patients referred to them

Psychiatrist Shares Combat Dangers

It is a curious but regularly observed fact that when the psychiatrist visits forward areas and makes personal contacts he becomes more highly regarded by the combat personnel His very presence demonstrates that he shares their viewpoint and interests The psychiatrist by such trips gains for himself firsthand knowledge of the problems of the combat officers both line and medical His recommendations display a practical understanding of the battle situation and insure a more ready accept

ance by the combat leader Basically, the visits of the psychiatrist make possible the phenomenon of identification, which on the one hand involves the sharing by the psychiatrists, even for a short time, the trials and tribulations of combat troops and, on the other hand, involves the sharing by the combat line and medical officer the efforts of the psychiatrist in the prevention and early treatment of emotional breakdown The division psychiatrist who remains in the rear is not considered to know the score" by combat personnel He is resented as one who fears to share their hardships and therefore does not belong in their world of deprivation and trauma In a certain sense this viewpoint of the forward personnel is correct, even though based on unreasoning emotional factors, for the psychiatrist can best objectively evaluate the manifestations and feelings of his patients when he possesses some of the background experienced by them

Self Inflicted Wounds

The psychiatrist of the 7th Infantry Division made a study of self inflicted wounds and found that 20 percent of such patients came from the new divisional replacements This survey, supported by the division surgeon influenced the divisional commander to establish battle indoctrination for infantry replacements The investigation made it logical to conclude that relative unfamiliarity with weapons plus numbing cold more readily permitted the ego to accede to a more or less unconscious wish for accidental injury and medical evacuation The institution of from 7 to 10 days training in the 7th Infantry Division caused a prompt decrease of self inflicted wounds It proved to have the further beneficial effect of giving the newcomer more confidence in himself as he learned battle tactics under experienced combat leaders Under such conditions of training the insecure replacements were especially motivated to absorb the knowledge imparted because they were frankly told that this instruction was akin to life insurance In the process of such battle indoctrination the new infantrymen began to experience group identification because they were taught that they could survive as part of a team The training period was also proof positive that his leaders considered his welfare and safety All in all, this preliminary instruction to the newcomer was a pertinent and valuable morale factor and a great improvement over placing the new and tremulous recruit into battle with no alleviation of his inevitable anticipatory anxiety From both the 1st Cavalry Division and the 25th Infantry Division psychiatrists came information to the effect that over half of their psychiatric casualties had about 9 months of combat service and were veterans of the early fighting in July and August 1950 Such patients were considered to have the old sergeants syndrome described in World War II

In all combat divisions, the division psychiatrist made the holding platoon of the clearing company his permanent base of operations Psychiatric patients were sent to this platoon for evaluation or treatment The holding unit was located in a rear position in respect to the other 2 clearing platoons and, therefore not subjected to as frequent dislocation as the other platoons which were more sensitive to the changing tactical situation of the division Patients with mild organic disease were also treated in the holding platoon to which usually 2 general medical officers were assigned The presence of medical officers in this treatment platoon obviated the need for a professionally trained assistant division psychiatrist It was not difficult to orient one of the young assigned medical officers in the use of the relatively simple physical and psychologic measures employed at this level The division psychiatrist was seldom absent for more than 24 hours so that all evaluations and major decisions were made by him The assistant division psychiatrist was mainly concerned with initiating or continuing routine treatment In addition the division psychiatrist had several enlisted assistants who had some previous psychiatric experience Their services were invaluable in the management and observation of patients at this level They were also useful in obtaining histories and gathering information for routine reports

Policy on Fitness for Combat

In March an informal army and theater policy that gave the division psychiatrist control over decisions as to fitness for combat duty at the division level was established It was believed that the psychiatrist operating within the combat group was in a better position to estimate the soldier s ability to perform combat duty than his colleagues further back When the psychiatrist in the forward area decided that a patient was temporarily disabled for divisional duty he added the initials DSB (don t send back) to the diagnosis of combat exhaustion This was honored by the next psychiatric echelon in hospitals of the Eighth Army Division psychiatrists were enjoined not to predicate the decision of the rear psychiatrist as to the fitness of patients for noncombat duty in Korea or Japan by indicating such a recommendation either directly to the patient or on the medical record In essence psychiatrists restricted their recommendations for duty to the particular level in which they functioned By this method the return of patients to combat by rear psychiatrists was prevented when the division psychiatrist had made a decision as indicated by the designation DSB * In cases where the DSB designation was omitted the decision for or against combat duty was the function of the rear echelon psychiatrist. In effect, this policy fostered respect for

the opinion of the individual psychiatrist, avoided iatrogenic tramua to patients, and allowed the receiving psychiatrist to make proper disposition of the patients

The division psychiatrists did not abuse their control over this criteria for combat duty because uniformly they were motivated to keep as many men as practicable on duty within the division They were active in obtaining reassignment within the division for battle weary riflemen or other neurotically handicapped persons who could be effectively used in a less strenuous position at regimental and division headquarters or service units

Another phase of the informal psychiatric disposition policy concerned persons with character and behavior disorders who in ordinary times were treated administratively under the provisions of AR 615 368 and AR 615 369 Previous experience in World War II and current experience in the Korean campaign strongly indicated that relatively few patients could be discharged under AR 615 369 in a combat unit because there was little time for administrative procedures and such a general discharge under honorable conditions would be construed as a reward for ineffectiveness, with a consequent undesirable effect on the morale of the unit Moreover, in wartime, persons in this category (AR 615 369) can be profitably employed in noncombat assignments because their personality defects are not so severe as to preclude their functioning under less stressful conditions

It was agreed that the division psychiatrist would evacuate such milder personality problems that could not be reassigned within the division The next psychiatric echelon would then reprofile the evacuee and recommend a rear assignment As a result of this procedure, it was demonstrated that most such patients could and did function effectively in noncombat positions when such a disposition was firmly made and the person pointedly reminded of his good fortune Even enuretics were treated by this method and became useful rear echelon soldiers when it was made clear to them that their problems from a practical standpoint mainly involved the availability of laundry facilities, of which there was no dearth in Korea or Japan In time, the use of AR 615 369 became rare in the Far East Command Such a reward is impractical in an overseas theater in wartime because of its deterrent effect on motivation It was *only* used on men with severely inadequate personality when it was evident that marked ineffectiveness in military life duplicated an inadequate civilian existence and they were literally incapable of being motivated toward effective work of any kind

Pathologic Personalities

Persons with pathologic personalities classified under AP 615 368 were *not* evacuated through medical channels but treated by administrative and disciplinary measures within the division These included narcotic and alcohol addicts habitual shirkers antisocial persons and those with chronic disciplinary problems This policy was based on the assumption that soldiers of this type could not be rehabilitated by reassignment Infantry divisions in the combat zone have relatively few persons of this type There is little opportunity for the usual disciplinary disorders and AWOL is a serious offense Alcohol and drugs are relatively scarce and addiction is much less of a problem In the 25th Infantry Division only 12 dispositions under AR 615 368 were made in a year of combat The fact that discharge under AR 615 368 is undesirable effectively limits the number of these discharges in the battle environment that insists on the giving up of selfish goals and the denial of rewards for un co-operative and antisocial behavior

The disposition of noneffective officers was solved satisfactorily in March 1951 Previously officers who demonstrated their unsuitability as combat leaders by reason of poor motivation or personality defects were either evacuated through medical channels or referred to their units for administrative action Neither method proved to be effective On the one hand the combat units did not have the time or the administrative machinery to cope successfully with the unwieldy process of AR 605 200 On the other hand medical evacuation was an obvious reward for poor performance As a result of these difficulties the Eighth Army Headquarters established a permanent AR 605 200 board under the direct supervision and control of the Eighth Army Judge Advocate General to process all cases that arose in that army This promptly removed the administrative burden from the combat units who were then more willing to recommend action of this type rather than press their medical officers to use medical evacuation By virtue of more expert guidance and accumulative experience the permanent board was readily able to accomplish the prescribed procedure The use of this permanent board became a uniform practice for the elimination of noneffective officers and in my experience which included similar difficulties in World War II this centralized method has proved to be the most effective solution to this vexing problem After 6 months of operation 45 officers had been processed under AR 605 200 and the proceedings against 13 of these were pending approval from Washington The fact that final action from the Department of the Army takes an average of 3 months during which time the officer concerned is of no use to the Army constitutes the major weakness in this procedure It would seem more advantageous either

to allow Army Headquarters or Theater Headquarters to take final action in a wartime theater in such cases, or permit the already boarded officer to return to the United States and there await the final decision of the Department of the Army

Psychiatric Centers

In the early phases of this period, the 4th Field Hospital at Taegu continued to be the main psychiatric center of the Eighth Army There were no particular changes in the clinical syndromes observed at this time, except in the proportional decrease in the number of patients with free floating anxiety in favor of those with displacement on somatic complaints Headache, backache, fatigability, urinary frequency, and gastrointestinal difficulties in that order were the most common symptoms Physical hardships from the cold and inclement weather coupled with the monotonous diet seemed as traumatic to the soldier as combat stress A large percent of the evacuees from forward areas had mild injuries, disease, or diagnostic problems The treatment and disposition of such patients at army level rather than evacuation to Japan was especially encouraged The salvage of men for duty was also stimulated by a directive from the theater commander who enjoined the Medical Service to make all possible efforts toward prompt rehabilitation of patients and to prevent their unnecessary hospitalization or evacuation

The main Eighth Army Headquarters was also located in Taegu, thus placing the psychiatric center of the 4th Field Hospital in a strategic position to give advice and consultation for the many administrative and medicolegal problems commonly encountered in a large headquarters

In February, another psychiatric center was opened at the 10th Station Hospital in Pusan This was a welcome relief to the overworked psychiatric section of the 3d Station Hospital (previously the 80o4th Evacuation Hospital)

The 121st Evacuation Hospital, after its withdrawal from northeast Korea in December, became operational at ToxondDong, about 20 miles from Taegu Its site was a frozen rice paddy, and rarely have I seen hospital personnel in such poor spirits They were cold and miserable, living in tents off the main channel of evacuation There was not even the solace of hard work that usually acts as a tonic to medical personnel who disregard physical discomfort when performing necessary functions In February, the unit was moved to Taejon Morale promptly improved as everyone became busy establishing and operating a winterized hospital, using the existing station hospital buildings as a nucleus The assigned psychiatrist initially received relatively few patients in this location because the condition of the air

field at Taejon did not permit its frequent use In March the unit moved to Yondongpo near Seoul and early in April was established in Seoul In this location the hospital was in the most favorable position to receive casualties from the combat area and the psychiatric section soon became quite active

Further progress was made in the organization and development of the psychiatric service in Japan It had been the usual policy to evacuate most Korean casualties by air to southern Japan from which point most of the evacuees were shipped by air and rail to hospital centers in Tokyo and Osaka This entailed a duplication of handling and hospitalization in Japan that was time consuming required additional personnel and delayed definitive treatment The Surgeon of the Japan Logistical Command had endeavored for sometime to have air evacuation routed directly to the various hospital centers in Japan but sufficient planes were not available until January to put this plan in operation The hospital centers in Tokyo and Osaka received 40 per cent of the casualties from Korea and 20 percent were sent to the medical facilities in the Fukuoka area in southern Japan

From the psychiatric standpoint the change in air evacuation was fortunate because the 3 psychiatric treatment centers were strategically situated obviating the necessity to transfer psychiatric patients within Japan The location of the 2 convalescent hospitals near Tokyo and Osaka respectively was also a convenient arrangement because it allowed the triage of ambulatory psychiatric casualties directly to the convalescent hospital thus by passing the fixed and more luxurious medical installation for a more realistic treatment environment Psychotic neurologic or other litter neuropsychiatric patients were sent to the psychiatric center located in the fixed hospital

The greater effectiveness of a convalescent type of environment over that of a fixed general hospital in the treatment of nonpsychotic psychiatric patients became obvious even in the early part of this period As time passed psychiatric therapy in convalescent hospitals was steadily increased as evidence that only severe mental reactions required treatment in a fixed installation accumulated At Omiya about 350 psychiatric patients were treated (75 with barbiturates and hypnotic interviews) Ninety per cent of the 350 patients were returned to noncombat duty the rest were transferred to the 361st Station Hospital because of psychotic or neurologic findings Similar results were obtained at the Nara Convalescent Hospital

Physical Profiling

The many difficulties inherent in the assignment of reprofiled (limited service) personnel were clarified during this period Ex

isting Army Regulations that allowed for a temporary change of physical profile were used as a basis for a theater directive which stipulated that persons so profiled be marked for "non combat duty in Japan only" A limited service category is a necessity in a combat theater overseas, otherwise large numbers of persons who would be quite capable of performing duty in one of the service corps would be returned to the United States for medical reasons This procedure operated satisfactorily as long as there were sufficient vacancies in units in Japan to absorb the reprofilees By January, it became increasingly difficult to find noncombat assignments in Japan and the following changes in the use of limited duty personnel were effected

1 The limitation "for Japan only" was deleted from the recommendation for assignment This opened more opportunities for the use of noncombat personnel in Okinawa and in rear areas in Korea

2 Re examination within 90 days for all reprofilees was made mandatory The status of persons found fit for full duty was continued for another period of from 1 to 3 months This procedure served partially to control the ever increasing number of limited service personnel

All reprofilees in Japan were re evaluated in February and March A surprising result was obtained from those in the psychiatric category when from 30 to 50 percent were found fit for full duty Although the criteria for return to full duty was not uniform, all psychiatrists had been instructed to consider a person fit for combat if he were free of overt anxiety or its somatic displacements, nightmares, and insomnia, and could return to combat without a recurrence of disabling symptoms All examiners reported that many welcomed a decision to return them to full duty, expressing a desire to prove themselves and to remove the feelings of inferiority that had been present since their removal from combat This reclaiming of psychiatric casualties after several months of noncombat duty is a new procedure in military psychiatry Unfortunately, no follow up studies are available to determine their effectiveness after restoration to combat This much is known on repeated questioning of the division psychiatrists in later months, it was rare to find persons with such a history among their patients Perhaps this favorable result was due to the influence of rotation that became fully operational in May and gradually removed the reprofiled combat personnel Despite the absence of exact information as to its effectiveness, there is sufficient data to indicate that such a reclaiming process is a practical procedure and should be given further trials There are powerful forces which impel the soldier who has had an emotional breakdown to return to combat They are discernible in the battle dreams and irritability of the neurotic casualty who constantly returns to the

traumatic situation that he was unable to master When forward psychiatry is operating effectively the combat casualty who is salvagable usually is returned to duty at the division or army level but when circumstances do not permit efficient combat psychiatric methods as occurred in the early days of the Korean campaign many reclaimable soldiers are rapidly evacuated and subsequently placed in noncombat positions

Arrival of New Units

Another major event occurring during this period was the arrival to Japan of 3 numbered general hospitals The 279th General Hospital became operational at Camp Sakai, near Osaka and the 382d General Hospital at Konoka Barracks in March the 343d General Hospital was placed on a standby basis at Camp Drew 50 miles from Tokyo and did not become operational until 1 October The pre existing psychiatric facilities were adequate so the psychiatric services of the 3 new hospitals were used only for consultation service and the personnel made available by this plan were absorbed in other assignments

In March plans were made and approved to rebuild the closed facilities of the 141st General Hospital Electroshock therapy apparatus was obtained and placed in operation An electroencephalograph was ordered

The 40th and 45th Infantry Divisions arrived in Japan during March and April The 45th Infantry Division was sent to Hokkaido and the 40th Division to northern Honshu Their mission was the defense of Japan and they began an active training program to reach combat readiness as soon as possible Each division had a psychiatrist The psychiatrist of the 45th Infantry Division also acted as the psychiatric consultant to the 161st Station Hospital which supported the division in Sapporo Hokkaido

THE SPRING CAMPAIGN
22 April to 10 July 1951

The so-called first impulse" of the long awaited Communist spring offensive began on 22 April with enemy onslaughts in the central and western sectors By 25 April enemy attacks were launched all along the line The U N forces withdrew in an orderly fashion to halt enemy penetrations in the west toward Seoul and in the east central region toward Chunchon The U N withdrawal to consolidated positions forestalled further Communist efforts By 28 April the U N forces formed an arc just north of Seoul from which our lines ran due east for 20 miles then northeast to the east coast near YangYang At some points we had withdrawn as much as 40 miles

Despite the sudden impact of battle, the increase in combat casualties, and the overrunning of our forward positions, there was no particular rise in the incidence of psychiatric casualties The rapid and orderly withdrawal of our troops broke contact with the enemy, removed battle stress, and gave time for physical recuperation This confirmed previous observations that psychiatric casualties are not increased during a retreat The post-offensive lull that followed was due to the inability of the enemy to continue the offensive because of poor logistical support This period lasted for more than 2 weeks, during which time our patrols sought contact with the enemy and there was a limited offensive by ROK forces in the eastern sector The decreased incidence of psychiatric casualties at this time was consistent with the low rate of battle casualties in general

The second impulse" of the Communist offensive began on 16 May, with the brunt of the attack in the east central sector For 5 days, ceaseless assaults were directed at the 2d Infantry Division which blocked enemy efforts to exploit a penetration of adjacent ROK divisions The truly heroic stand of the 2d Infantry Division resulted in a large number of battle casualties and psychiatric breakdowns The U N forces in this area were pushed back 15 miles The 3d Infantry Division was moved to bolster the eastern sector and by 21 May the enemy attack was contained

The Counterattack

For the first time in the Korean campaign the U N forces promptly passed to the attack after halting an enemy offensive The counterattack threw the Communists into a disorganized retreat By 28 May the 38th parallel was again reached, 12,000 prisoners were taken, and a total of 100,000 enemy casualties inflicted since the beginning of their April offensive The low incidence of psychiatric casualties for the second half of May reflected the high morale of a victorious, rapidly advancing offensive despite the many battle casualties

The U N offensive continued through early June, but against stiffening opposition On 13 June, strategic Chorwon and Kumhwa were seized and by 15 June the U N forces generally reached their objectives and were deployed in a strong line from 15 to 20 miles north of the 38th parallel Patrol action marked the remainder of this tactical phase as peace-talk rumors culminated in the beginning of truce negotiations on 10 July

The increase in the number of psychiatric casualties in the first half of June was to be expected in the presence of slow uphill fighting against determined opposition

Division psychiatry was performed in an experienced effective manner during this period About 60 percent of the patients were returned to combat The enemy offensive of 22 April forced the withdrawal of the 121st Evacuation Hospital from Seoul to Taejon and thus out of the main evacuation channel Psychiatric evacuees were not numerous and were readily cared for by treatment units in Taegu and Pusan In May the 121st Station Hospital returned to Yondongpo, on the south bank of the Han River across from Seoul This was an excellent site strategically located to receive and evacuate casualties by air and rail, that soon made the unit the major hospital center for all types of patients and the psychiatric center of the Eighth Army The 11th Evacuation Hospital arrived in Korea in May and became operational at Chungju off the main evacuation route and a great distance from the combat area It was mainly used for the holding and treatment of patients with minor wounds injuries and disease

The spring offensive in Korea produced only a slight increase in the psychiatric patient load in Japan Screening and salvage by division psychiatrists and Army treatment units had become progressively more effective so that about 90 percent of psychiatric casualties were returned to combat and noncombat duty in Korea Most of the remainder, evacuated to Japan were suffering from psychotic reactions neurologic disorders (mainly unconfirmed epilepsy) and severe neurotic reactions It became increasingly rare to find among the psychiatric evacuees patients capable of being returned to combat from Japan Minor reactions and character disorders originated mainly from service units in Japan and were usually treated on an outpatient basis The total psychiatric inpatient census in Japan remained at about 300 with 150 at the 361st Station Hospital 50 each at Osaka Army Hospital and the 141st General Hospital and the rest scattered among the small psychiatric units of other medical installations About 100 patients, most of whom had psychoses or neurologic problems were evacuated to the United States each month This represented about 5 percent of all the patients evacuated to the United States from Japan

Rearrangement of Psychiatric Personnel

The major problem in Japan during this period was the rearrangement and replacement of neuropsychiatric professional personnel Six naval medical officers on loan to the Army since December 1950 were returned to Navy control in June They had performed in a superior manner and played an important part in the development of the psychiatric program in the FEC An equally difficult loss to absorb at the same time was the return to the United States of 5 Regular Army physicians from Japan and 4 from Korea

The most serious professional shortage was in the field of neurology Five of the 6 neurologists in the theater were in the group returned to the United States The neurologist who remained was transferred to the 361st Station Hospital in June to insure a continued functioning of the most important neurologic center New arrivals to the theater during this period, who partially offset our professional losses, included 9 psychiatrists

The problem of obtaining electroencephalographic technicians for the new EEG apparatus at Osaka Army Hospital and the 141st General Hospital could not be solved by the requisition of trained personnel Four electroencephalographic technicians, who proved capable of satisfactory work in their assignment at the Osaka Army Hospital and the 141st General Hospital, were trained by a short intensive course at the 361st Station Hospital

TRUCE NEGOTIATIONS AND UNLIMITED OFFENSIVE ACTIONS 10 July to 1 October 1951

The beginning of the truce talks in July continued for several weeks Soon it became apparent that optimism regarding an early end to the Korean fighting was not warranted Offensive moves by the U N forces began later in July and were episodically renewed in August and September, when severe combat produced a large number of battle casualties The U N attacks were aimed at improving our positions, particularly in the east central sector in order to obtain a shorter and more defensive battle line Our efforts were largely successful, but the capture of stubbornly defended hill masses was a slow and painful process Although patrol actions and limited engagements took place in the western area, the units in the east central zone, particularly the 2d Infantry Division, the 1st Marine Division, and, to a lesser extent, the 7th Infantry Division and 24th Infantry Division bore the brunt of the offensive combat

Influence of Rotation

The psychiatric rate was only slightly elevated in response to the increased battle casualties Perhaps the principal reason for the continued relatively low incidence of psychiatric breakdowns was the influence of rotation For this reason adverse reaction from the pessimistic progress of the peace talks was minimal Relief from combat had become an individual affair, obtainable by the person, regardless of the outcome of negotiations Rotation became the chief topic of conversation among troops in Korea, for on it depended their hopes and dreams As practiced, it was a new phenomenon for American combat forces Although it is without doubt a step forward in preventive psychiatry and has proved its value, there are inevitable and

undesirable by products The most pertinent defect of rotation aside from the logistical problems is the disruption of the su taining power of group identification that occurs when the soldier is notified or becomes aware that soon he will go home Increa e of tension follows Such a short termer shifts his thou hts and feelings away from the group and often for the first time battle fear becomes unbearable because emotionally at least he becomes disengaged from his buddies and becomes con cerned only about himself The consequent rise of anxiety produces in some an inability to function In most tension noticeably increased in the last few days of combat as if it were now dangerous to tempt fate One can always hear stories undoubtedly exaggerated of the unlucky person who was killed the same day he was scheduled to leave on rotation The other men of the group readily identify the short termer by the spontaneous actions of units in sending the rotatee to a rear safe position or insuring his relief from patrol or other hazardous duties The short termer" often has mixed feelings about leaving because the ties to his buddies do not loosen so easily but it is rare for one to give up the rotation opportunity because such be havior would be regarded as queer or unusual by the group Perhaps the most effective form of rotation would be the removal of entire combat units or at least its older or original members Such a method would be most difficult to accomplish from a logistical standpoint.

The 2d Infantry Division had taken a major share of the uphill offensive fighting As a result their psychiatrist was the busiest of the division psychiatrists He collaborated with the Assistant Division Commander in establishing an intradivisional training program for replacements that was probably the most comprehensive effort of this type

The periodic visits by the division psychiatrists to battalion aid stations strongly encouraged and influenced the battalion surgeon in the evaluation and treatment of combat exhaustion More and more the first echelon of psychiatric treatment par ticularly in secure tactical situations was given in the battalion aid and collecting station

The 121st Evacuation Hospital continued to serve as the principal psychiatric center of the Eighth Army throughout this period The psychiatric service had developed excellent physical facilities sufficient to care for 100 patients The psychiatrist was supported by a psychiatric social worker, who took over much of the administrative detail assisted in consultations oriented new admissions began group therapy sessions and supervised the recreational program An enlisted clinical psy chologist joined the service in August and another psychiatrist was added in September The gradual shift of Eighth Army Head-

quarters from Taegu to Seoul brought the neuropsychiatric staff in greater contact with the administrative and medicolegal problems that require psychiatric consultation

Experiences in the use of psychiatrists at army level in Korea has consistently demonstrated the value of the psychiatric team Such a professional team functions in an identical manner as a surgical team The small group of trained personnel can be moved to any medical installation that is strategically located to receive casualties, be it a separate clearing company or an evacuation or field hospital No doubt when there is continuous static warfare or a large production of psychiatric casualties, as in the ETO of World War II, a separate psychiatric unit may be preferable But in the first year of the Korean campaign, with its many tactical reverses difficult transportation problems, and dangerous rear areas, it was necessary to consolidate medical facilities and have alternate or reserve treatment facilities The psychiatric team could begin functioning almost immediately in any unit that provided housekeeping facilities

There was no essential change in the organization and operational procedures of psychiatric service in Japan during this period The policy of the decentralization of psychiatric patients along with an emphasis on the outpatient and convalescent type of therapy for minor reactions was a well established development Patients with major mental or neurologic disorders or diagnostic problems were hospitalized at 1 of 3 well staffed neuropsychiatric centers, each equipped with closed ward facilities, EST apparatus and an EEG machine

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Anxiety is a relatively new concept in medicine Despite the universality of subjective experience only in recent decades has this major source of discomfort begun to receive some of the attention and study which it has most urgently warranted

—HENRY P LAUGHLIN M D
in *Medical Annals of the District of Columbia*

CHRONIC DIARRHEA

A Clinical and Laboratory Study of 39 Cases

HENRY KRAUS F t L t t MC USAR

DIARRHEA and dysenteric diseases comprise an important segment of the problems encountered in military medicine This observation is emphasized by the fact that 10 percent of the 3 100 admissions to the medical service of this hospital during 1952 were for one of these diseases Many had an acute self limited disease of unknown cause and required only control of nutrition and fluid balance for effective treatment. A similarly large group of patients had chronic diarrhea This latter group was more important from the standpoint of individual disability and the number of hospital days required for treatment and rehabilitation

In view of the importance of chronic diarrhea as a disabling disease in terms of man days lost from duty it was worth while to determine the most common cause of it so that specific preventive measures and therapy could be practiced It was recognized that the results and conclusions of this study would be applicable only to the peculiar environmental and sociologic circumstances surrounding troops stationed in Japan and Korea Nevertheless it was of general military interest and as such would stimulate further efforts toward the prevention of these diseases

Materials and Methods

Thirty nine U N soldiers consecutively admitted to the gastroenterology ward from September 1952 to March 1953 with a history of chronic diarrhea were studied Patients who had four or more loose stools daily for at least one month were classified as having chronic diarrhea The diarrhea was frequently associated with cramps urgent bowel movements, and blood in the stools In several instances the symptoms had been present intermittently for as long as eight years Twenty six of the patients were from the United States four from France two each from Belgium and Ethiopia and one each from Puerto Rico, Colombia Philippines Greece and Holland Six regularly passed stool specimens from each patient were examined by concentration technics for the isolation of ova and parasites

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Half of these specimens were sent to the 406th Medical General Laboratory, Tokyo, for examination Each patient was then purged with magnesium sulfate and the resultant stool specimen was examined for ova and parasites and cultured for ameba and pathogenic bacteria Similar cultures were made on two regularly passed stool specimens using SS and E M B agars for bacteria and Boeck Drbohlav and Nelson's alcohol extract media for ameba. Each patient was examined through a sigmoidoscope and multiple aspirations were taken from the walls of the rectum and lower sigmoid, particularly at the sites of existing lesions These specimens were examined directly for ameba and cultured for bacteria and ameba A sterile swab stick was inserted into the rectum of each individual and then cultured directly for bacteria.

Results

The results are indicated in table 1 The bacterial cultures for enteric pathogens were negative in all instances *Endamoeba histolytica* trophozoites or cysts were found in 27 patients, 17 had cysts and trophozoites, 9 had only trophozoites and 1 had only cysts Two or more separate specimens were positive in 23 of the 27 patients, and in the other 4 patients only one specimen was positive The diagnosis of amebiasis could have been made on a regularly passed stool in 16 patients and in a purged stool in 9 patients In 7 other patients the stool specimens contained intestinal parasites other than *E histolytica* These included *Taenia saginata Giardia lamblia, Trichuris trichiura Endamoeba coli Endolimax nana, Iodameba bütschlii, Strongyloides stercoralis* and hookworm ova

TABLE 1 *Diagnoses made in 39 patients with chronic diarrhea*

Diagnosis	Number
Amebiasis	27
Trophozoites and cysts	(17)
Trophozoites only	(9)
Cysts only	(1)
Other parasitic diseases	7
Chronic thrombotic ulcerative colitis	1
None	4
Total	39

On sigmoidoscopic examination mucosal abnormalities suggesting amebiasis were seen in 23 of the 27 patients in whom *E histolytica* was isolated In 4 of the 12 patients in whom no

ameba were observed similar abnormalities of the intestinal mucosa were seen These lesions consisted of yellow brown, pinpoint superficial abscesses of the intestinal wall, usually occurring in groups When the contents of these lesions were aspirated, shallow ulcers appeared

One patient with severe diarrhea had sigmoidoscopic and roentgenographic evidence of chronic thrombotic ulcerative colitis No pathogenic organisms were isolated from him

Discussion

The high incidence of amebiasis in this group of patients is hardly unexpected While no accurate figures are available, it is the impression of many competent observers that chronic ulcerative colitis is a rare entity in the Army Bacterial dysentery is probably not uncommon but it is frequently adequately treated on an outpatient status and thus remains unrecognized by the early use of wide spectrum antibiotics Such patients are rarely referred to the general hospitals The important consideration in respect to the indiscriminate use of antibiotics for the treatment of diarrhea is the fact that many patients with amebiasis are unknowingly given ineffective doses of antibiotics This diminishes the number of free ameba in the intestine makes later diagnosis by stool examinations more difficult and does not produce a satisfactory cure of the disease These patients are referred to general hospitals when there is a recurrence of their signs and symptoms

The high incidence of amebiasis in this series of patients can be explained by the fact that we were dealing with soldiers stationed in endemic areas and subject to the dangers of primitive indigenous sanitation There was good evidence however that many of the patients acquired their infections prior to their service in this theater of operation This was especially true in the French and Dutch soldiers who had acquired their infections elsewhere in Asia and in several American soldiers whose histories of diarrhea antedated their service in the Army

Summary

Thirty nine patients with a history of chronic diarrhea were studied by extensive parasitologic and bacteriologic technics to determine the various causative agents involved *E histolytica* was found in 69 percent. No bacterial pathogens were isolated One patient had sigmoidoscopic and roentgenographic evidence of chronic thrombotic ulcerative colitis

preserved grafts were uniformly negative only occasional pc cultures have subsequently been done There have been no i fections associated with grafts from bone preserved by th method We have been unable to detect any perceptible clinical o radiographic difference between the patients who received graf from the penicillin streptomycin bone bank and those in whc fresh autogenous bone was used Because of limited sources of bone and the frequent need for grafts all bone banked has been used within three months Experience with bone preserved longe than this is lacking Until further information regarding the ultimate changes in banked bone is available we prefer to use our material within six to eight weeks of preservation

The critical evaluation of a method of banking bone for grafting purposes depends on (1) the incorporation and survival of the banked graft material within the body and (2) a low infection rate Secondary features of an acceptable method include simplicity and economy

Effacement of a nonunion or the production of new bone depend largely on other factors such as aseptic necrosis rather than on the bone banking method Reconstitution of transplanted bone is ordinarily judged by the roentgenographic pattern and by the clinical result such as restoration of continuity of the bone shaft Transplanted bone may remain viable and yet not fulfill the purpose of the procedure for reasons unrelated to the banked bone or banking method In a few patients nonunions have persisted after use of bone preserved by the penicillin streptomycin banking method due to unwise operative methods

In a successful case a transplanted bone graft will survive and unite to the host bone Marked hypertrophy of transplanted bone occasionally occurs but is rare A transplanted graft that has not been adequately apposed to the bone of the host frequently fails to unite To avoid this occurrence we devised a bone flaking apparatus to produce bone particles which fostered broad contact and union The value of transplanted homogenous bone is similar to fresh homogenous bone but consolidation is slower Neither the method of preservation nor the degree of physical disintegration seem to be important Contact between the bone elements and vascularity of the host bone are required for consolidation of the graft.

A simple and practical means of preserving available bone is useful to orthopedic surgery While there are several methods of preserving bone grafts and each has its own use few meet the requirements of an individual surgeon who does not have need for a large quantity of bone or the facilities for freezing or dehydration or the staff to operate a complex preservation procedure

Our bone banking method has been evaluated by criteria used in such procedures We have established as a test for bone graft incorporation which is its roentgenographic appearance in comparison with normal bone, the successful completion of the operative mission, and the absence of infection During the past three years in this hospital, our banking method for bone has been in constant and routine use The most important aspect of this method of banking presented is the absence of infection associated with the use of such banked bone over a six year period

Bone most frequently used is from the middle third of the fibula Loss of this area of bone apparently is not disabling Complications of hematoma formation or infection at the donor site have not been troublesome

Processing the Bone

The procedure of processing the bone for use is

1 In a sterile bottle, about the size of the contemplated graft (fig 1), 200 000 units of penicillin and one gram of streptomycin are placed and the bottle is then two-thirds filled with sterile saline



Figure 1 Materials required to bank bone in a penicillin streptomycin solution. The small bottle is a standard pharmaceutical pill bottle available in several sizes

2 The bone is secured cleaned of soft tissue and is immersed at once in the *prepared bottle of penicillin streptomycin* solution

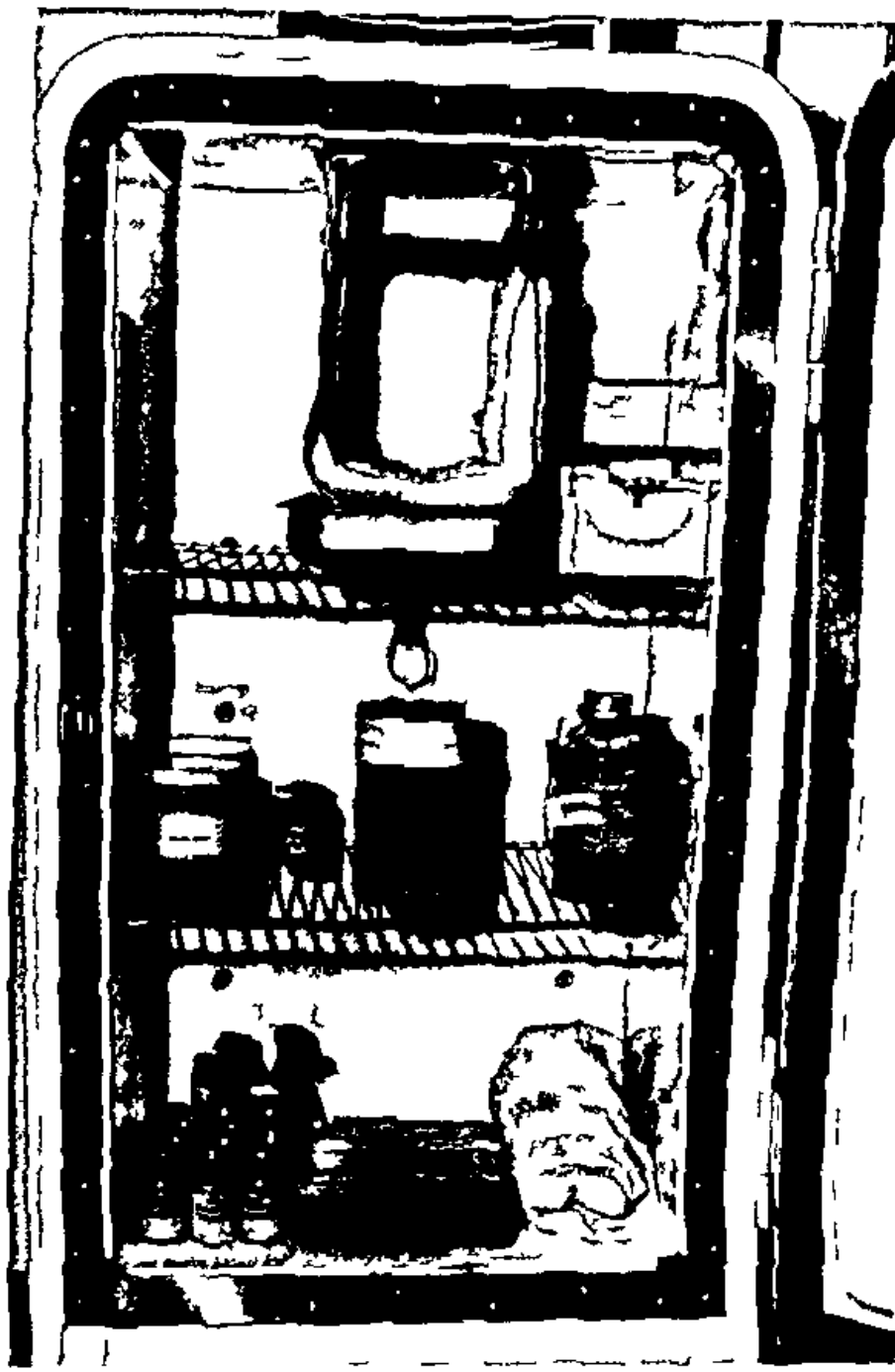


Fig 2 Bone knob bottle for immersing bone in penicillin streptomycin solution Note that the bottle may be easily elected

3 The bottle is then completely filled with saline solution so that when the stopper is in the bottle it can be inverted without an air bubble appearing

4 The cap is screwed down securely and the bottle is inverted to check for leakage Should leaks appear a new bottle must be used

5 The graft bottle is placed in a second larger sterile bottle which is then filled with zephiran (benzalkonium chloride) solu tion (A sponge placed between the tv o bottles prevents break age (fig 2))

6 The double bottle is covered and labeled to show the name of the donor, the date, and the source of the bone

7 The bone graft is placed in the operating room refrigerator at about 50 F (Temporary current failure can be disregarded)

A protocol sheet showing the name of the donor, the date, the type of bone banked, and other pertinent details is filled out for each individual bone graft or banking procedure Contamination of the bone should be avoided by minimizing handling and ex posure to the air

Preparation for using bone banked by this method follows

1 The selected bone is removed from the refrigerator

2 The inner bottle, containing the graft, is removed with for ceps and immersed in a zephiran rinse basin

3 After 10 minutes, the bottle may be removed dried and transferred to the instrument table where it is opened

4 The bone is removed as needed with forceps

5 Bone not used is placed in a fresh bottle with new peni cillin streptomycin solution and reprocessed for banking

Summary

Preserving bone in a penicillin streptomycin solution is simple, requires no special equipment or trained personnel and is inex pensive One hundred grafts have been done using bone so pre served There have been no infections All bone preserved by this method and used as a graft has integrated.

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TWO CLINICAL USES OF THE BENDER VISUAL-MOTOR GESTALT TEST

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IN using the Bender Visual Motor Gestalt test in a military combat setting two aspects of the test appeared to merit investigation (1) Its usefulness in group testing because of the necessity for quick assessment of a large number of patients and (2) its usefulness in the detection of malingerers prompted by the discrepancies between reported claims made for the test and our observation of its effectiveness

GROUP ADMINISTRATION OF THE BENDER GESTALT TEST

In view of the comparative ease and rapidity with which the Bender Gestalt test can be given to one person its use for group testing would probably not be necessary in most clinical situations but the peculiar problems of a neuropsychiatric hospital in a combat zone demand the speedy disposition of relatively large numbers of patients Any time saving procedure is of potential value

The problem was to devise a method of group administration of the Bender-Gestalt test and to check the clinical usefulness of the drawings so obtained It was assumed that if the drawings by the group method of testing were not significantly different from those obtained by individual testing then the same interpretations could be applied to both

Sixty four Army neuropsychiatric hospital patients were divided into experimental group A and control group B group A consisting of the first 32 patients consecutively admitted to the hospital and group B of the next 32 patients admitted The number of patients selected was arbitrary and conformed to the limits of time and personnel available for carrying on the study All patients were first tested individually and then, from four to six hours later those in group A were given the test in a group and

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patients in group B were retested individually In all tests, the standard instructions were given and the standard materials were used, except that for the group administration of the test, the designs were enlarged three times normal size on 10 5/8 by 15 1/2 inch, white, cardboard cards

The test and retest papers, each of which bore a special code marking for later identification, were shuffled, those of group A being kept separate from those of group B Two clinical psychologists, who had not participated in the administration of the tests and who did not know the code markings on the test papers, attempted to match the test paper with the retest of each patient The psychologists were allowed to confer with each other in matching the test papers The results of the matching are seen in table 1

TABLE 1 *Results of matching the tests with the etests*

	Correctly matched	Incorrectly matched
Group A	28	4
Group B	32	0

All Bender-Gestalt test papers for both groups were also scored separately by the Pascal Suttell system [2]

Applying the significance of difference formula (X^2) with Yate s correction for continuity[3] to these data indicates that there is no significant difference in the success of matching the tests and retests for patients in group A and in the control group B

The distribution of Pascal-Suttell scores for Group A is given in table 2 and for group B in table 3

The Pearson product-moment correlation (r) calculated and the standard deviation (σ) for the test retest scores of group A indicate r - 84, σr - 053 and for the test-retest scores of group B r - 65, σr 102

Both product-moment correlations differ significantly from zero However, a check of the significance of the difference between the two correlations using the formula $\sigma z1\ z2 - \sqrt{\frac{1}{N_1 3} + \frac{1}{N_2 3}}$ as outlined in McNemar[3] indicates that the difference between the two correlations is not significantly greater than chance expectancy (at the 05 level)

TABLE 2 *D t but f t t and t t f g p A d g t th P l S tt ll s*

P l S tt ll s	I d dual t t f q y	G oup te t (t t t) f q y
190 199		
180 189	1	1
170 179		1
160 169		
150 159		1
140 149	1	1
130 139	2	
120 129	1	4
110 119		1
100 109	4	3
90-99	2	2
80-89	2	7
70 79	7	6
60-69	4	5
50-59	5	
40-49	3	
	32	32

TABLE 3 *D t but of t t nd t t f g p B d g t th P l Sutt ll*

P l-S tt ll	I d d l t t f q y	I d d l t f q y
190-199	1	1
180-189		
170-179	1	1
160-169	1	1
150-159	1	2
140-149		
130-139		1
120-129		3
110-119		
100-109	3	1
90-99	11	2
80-89	12	10
70-79		2
60-69	1	4
50-59	1	2
40-49		2
	32	32

It has been shown that no significant difference occurs in the Bender Gestalt test when comparing group testing with individual testing This has been found by both a clinical matching procedure and using objective scoring criteria The group administration of the test produced results similar to those obtained by the individual administration of the test From this it can be concluded that group testing can be clinically administered and treated according to the principles of interpretation of the individually administered test and we can feasibly use the group method when the speedy disposition of large groups of patients is required The interpersonal cues so necessary for the evaluation of behavior, cannot be gained from the group administration of the test, nor can behavior variation in the drawings, such as card and paper rotation, be observed Regardless of the graphic equivalence of the tests, their limitations are such that the group method can be used only in demand situations

BENDER VISUAL MOTOR GESTALT TEST IN DETECTION OF MALINGERING

In her monograph on the Bender Visual Motor Gestalt test[1] Bender suggested that attempts to consciously distort the reproduction of the figures, as in malingering, can be detected She stated that the gestalt of the figures for instance, will be apparent in spite of other graphic changes Hutt[4] also indicated that malingering can be detected by the Bender-Gestalt test He stated that the consciously distorted drawings will be small, inhibited and uneven and postulated that the Gestalt principles will remain on a high level, and that the symbols will be simplified Using the Bender Gestalt test in a military setting we have observed that so-called malingerers often produce records which cannot easily be differentiated from clinically ill mental patients

Our problem was to test the hypothesis that malingerers cannot be differentiated from clinically ill psychiatric patients by using the Bender-Gestalt test For the purposes of this study malingering is defined as a conscious attempt to appear mentally ill

Two groups of people were tested Group C consisted of the first 35 patients admitted consecutively to an Army combat neuropsychiatric center who had been diagnosed as mentally ill and included psychotic neurotic organic brain damage and mentally deficient cases and had been given the necessary psychologic tests Group D consisted of 35 enlisted men of an Army medical holding company selected by taking every third man on the alphabetical roster They were serving in various capacities in the maintenance of a combat neuropsychiatric center and had some observation of neuropsychiatric patients but none had

ting to act ill for selfish reasons Therefore whether or not their drawing performance is similar is undetermined The inclusion of clinically ill persons functioning in a normal fashion in the maintenance unit and of malingerers having been diagnosed and included as clinically ill is a possibility The small size of the sample groups may increase the likelihood of these difficulties to be uncompensated for even by the operational definitions employed in this study The assumption is also made that malingerers are not mentally ill or that they differ from persons with other forms of behavior disturbance In the matching technic the clinical competence of judges and the untested reliability of their ratings are additional variants

A review of the protocols of group D showed some of the drawing features which served as differential signs in those records which were correctly matched Those noticed are

Substitution One geometrical figure was substituted for another without losing the Gestalt or showing a decrease in drawing proficiency for example, a circle was drawn instead of a diamond in the center of drawing No 8

Increased complexity Well controlled graphic elements were added to the figures for example extra symmetrical loops were placed on drawing No 4

Inconsistency Difficult designs were well done even though simple ones had been distorted and there was variability among them

Symbolism Figures were converted to simple symbols which did not correspond with the symbols often used by psychopathologic persons

These are offered only as clinical observations which may be subjected to systematic investigation They conform to those of Hutt and Bender[4] only in regard to the uneveness of performance and the maintenance of the gestalt

SUMMARY

This study employed the Pascal Suttell scoring system and a pooled judgment technic in an attempt to differentiate between clinically ill neuropsychiatric patients and experimental subjects instructed to malinger on the Bender Gestalt test The Pascal Suttell method did not demonstrate significant differences between the two groups The clinicians were able to differentiate the productions of malingerers from those of mentally ill patients The original null hypothesis of the study to the effect that malingerers could not be detected was rejected

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DOCTORS ON EVEREST

The climbing of Everest is a triumph already acclaimed wherever the victories of the human spirit are prized above those of the market place The silent challenge of its peak has attracted eleven expeditions—not all intended to gain the summit—and sixteen lives have been lost in meeting it If courage and resource are the qualities preeminently needed to explore those wastes of rock and snow solutions to the physiological problems of living strenuously at high altitudes were no less necessary to the success that added a further touch of splendour to Coronation Day

Medical men have contributed much to make these expeditions possible at all both in helping to design suitable equipment and in accompanying and sometimes leading the climbing parties they have also to carry out the essential but less spectacular duties of looking after the members of the expedition in the long approach to the mountain. The doctor in medical charge of the expedition besides advising on camp hygiene may have to deal with almost any medical or surgical emergency in one of the most remote parts of the world from setting a broken limb to treating heatstroke or frostbite His is the duty also—a familiar one to regimental medical officers during the war—of looking out for early signs of the mental disturbances that can have such serious consequences if allowed to develop and spread among strained and tired men In giving advice on acclimatization the experience of a mountaineer-doctor is invaluable to the leader of the expedition At Himalayan altitudes and especially above 20 000 feet the benefits of becoming acclimatized are apt to be offset by a deterioration in health whose cause is not clearly known Individuals vary greatly in their response to these stresses but after a time nearly everyone suffers a diminution of nervous control and a loss of weight which may be severe There are in addition the hazards of a violently fluctuating temperature which specially designed equipment can only partially mitigate Bright sunlight by day may cause heavy sweating to be followed by subzero temperatures at nigh and perhaps even more difficult to overcome than the low oxygen tension is the dehydration that these altitudes cause

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CROSS RESISTANCE OF BACTERIA TO ANTIBIOTICS

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THE increasing number of available antibiotics has not completely resolved the problem of bacterial resistance to them In some instances, these newor drugs have served to complicate the immediate resistance problem by introducin the phenomenon of cross resistance of bacterial species to other antibiotics Gocke and Finland[1] have recognized cross resistance as a possible clue to the clarification of the more fundamental explanation of the "resistance riddle of the bacterial universe With the determination of the chemical structures of various antibiotics metabolic studies of a more fruitful nature can be pursued The explanation of the modes of action of particular antibiotics may give insight into methods of deter ring or even reverting bacterial susceptibility to them

Cross resistance to agents of a similar chemical nature is not entirely unexpected Kirby and Rantz in the sulfonamide era demonstrated cross resistance of *Escherichia coli* and the gonococci to various sulfonamides

It is significant that most of the major antibiotics which are relatively nontoxic to man are derived from the genus streptomyces Penicillin is obtained from the fungus penicillium and bacitracin polymyxin and circulin are extracted from bacteria Thus a major group of our antibiotics are of the same generic heritage The habitat of antibiotic producers is relatively similar and it is possible that individual survival of particular genera is dependent on the elaboration of specific metabolites or antimetabolites

Permanency of Resistance

Experiments have shown that micro organisms can be trained to grow in certain substrates with the loss or acquisition of specific properties In this process it is assumed by some workers that alternate metabolic pathways are established within the organism together with a reorganization of the chem ical processes [2-5] These changes may be permanent or temporary

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Extensive studies in many laboratories have demonstrated that penicillin resistant staphylococci will lose this resistance when transferred in antibiotic free medium [6] Current studies with staphylococci which are resistant to aureomycin, terramycin (oxytetracycline), and/or chloramphenicol have not demonstrated this loss in resistance Murray and co-workers[7] have shown that no loss occurred in streptomycin resistance after 100 serial transfers in antibiotic free media The change of micro-organisms from being sensitive to being resistant to aureomycin, terramycin, chloramphenicol, and streptomycin, whether chemically induced or by genetic selection, appears to be relatively permanent

Our Studies

Our in vitro studies in attempts to demonstrate cross resistance between penicillin and the broad spectrum antibiotics, aureomycin, terramycin, and chloramphenicol, proved fruitless [8] Yet, increasing numbers of micro-organisms that are resistant to all four of these agents are being isolated A comparison of micro-organisms resistant to, with those sensitive to aureomycin, terramycin, and/or chloramphenicol showed that there were twice as many staphylococci resistant to penicillin in the resistant group as there were among those organisms which were sensitive to those broad spectrum antibiotics In these studies an indirect mechanism of cross resistance was suggested [9]

Recently, preliminary resistance studies with erythromycin[10] on staphylococci have yielded some very interesting results Resistance was induced in organisms of several different resistance patterns to various antibiotics The results of two groups of these organisms were particularly worthy of note When erythromycin resistance was induced in those organisms which, prior to erythromycin exposure, were resistant to broad spectrum antibiotics and sensitive to penicillin, they showed an increase in resistance to penicillin and erythromycin and no loss of the broad spectrum resistance The control group of organisms which were sensitive to all the major antibiotics gave evidence of increased resistance to erythromycin only after exposure to erythromycin When parent organisms which originally were penicillin resistant were transferred to increasing concentrations of erythromycin, they not only showed continued penicillin resistance but also increased resistance to erythromycin Thus in this series of experiments it appears that a one way cross resistance can be established between penicillin and erythromycin if the organism originally is broad spectrum resistant. More studies are in progress to elaborate these findings [11]

Other Investigations

Evidence by other investigators has confirmed the occurrence of cross resistance between aureomycin and terramycin[1] [11] Most investigators believe that three way cro s resistance between aureomycin, chloramphenicol and terramycin is unpredictable Structurally there is a chemical similarity between aureomycin and terramycin[16] [17] which could be influencing this phenomenon Chloramphenicol *differs in configuration from the* two foregoing antibiotics but cross resistance relationships to these three antibiotics have been established in certain micro-organisms[1] [3] Strains of *Aerobacter aerogenes* tend to develop resistance and cross resistance to a greater degree in a shorter time than other genera Strain variation of cros resistant behavior has also been noted by Pagano and co-workers[1] in studies with streptomycin and related antibiotics

In genetic studies of microbial cross resistance of *E coli* to antibiotics Szybalski and Bryson have demonstrated what they consider four groups of cross resistance

1 Organisms resistant to streptothricin viomycin vinactin cantenulin and neomycin are also resistant to streptomycin but the converse does not hold true

2 Aureomycin chloramphenicol and terramycin are less closely related to penicillin and neotropin

3 Organisms resistant to polymyxin and neotropsin show a one way cross resistance to streptothricin contenulin neomycin and streptomycin

4 Bacitracin resistant organisms showed no cross resistance to other antibiotics

Haight and co-workers[3] have shown cross resistance with *certain limitations in micro-organisms to neomycin and streptomycin* When an increase in resistance of bacteria to neomycin was demonstrated, significant increases in resistance to streptomycin also developed the converse did not hold in all experiments No cross resistance occurred between streptomycin or neomycin and penicillin aureomycin terramycin chloramphenicol bacitracin or polymyxin B Gezon and Fasan, and Pagano and co workers[18] confirmed the foregoing with respect to the variability of cross resistance to streptomycin and neomycin

Recent investigations have shown that there is no direct cross-resistance relationship between carbomycin [3] or erythromycin [4] and other major antibiotics However, a cross resistance relationship does exist between carbomycin and erythromycin [4] Preliminary studies with these two agents gave promise for their use against penicillin resistant *micro-organ*

isms However, this new problem of cross resistance could rule out the possibility of using carbomycin against erythromycin resistant organisms or vice versa

Application

The practical application and interpretation of the foregoing findings will continue to play a significant role in antibiotic therapy No longer can the physician assume that in all cases a given bacterial infection will respond to a given antibiotic His alternate choice of therapy must be guided by the information that resistance and cross resistance studies have contributed It is the responsibility of the laboratory to provide adequate information concerning resistance of the necessary infectious agents in the shortest time possible

The study of the fundamental mechanisms involving bacterial resistance to antibiotics must be studied with increased vigor The thousands of organisms which have been screened in the past decade with a yield of a relatively few desirable antibiotics makes the outlook for "super" antibiotics pessimistic The combined efforts of geneticists, bacteriologists, biochemists, and physicists can best resolve the "resistance riddle of the bacterial universe" through more basic studies in bacterial metabolism

Summary

The selection of alternative choices of therapy should be guided by the information contributed by cross resistance studies

Aureomycin would probably not be selected as alternative to terramycin, or vice versa, in refractory conditions due to resistance In some bacterial genera and species, organisms resistant to aureomycin and/or terramycin are also resistant to chloramphenicol Organisms resistant to viomycin and neomycin may be resistant simultaneously to streptomycin Carbomycin would probably prove ineffective against erythromycin resistant organisms, or vice versa Among organisms which were resistant to aureomycin and terramycin, exposure to erythromycin produced a resistance to penicillin in experimental studies

With the problems of resistance and cross resistance so apparent, the in vitro antibiotic sensitivity test should be done on certain micro-organisms

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MILITARY DERMATOLOGISTS TO MEET IN CHICAGO 8 DEC

The third annual meeting of the Association of Military Dermatologists will be held on 8 December 1953 at the Palmer House in Chicago under the presidency of Lieutenant Colonel William N Piper, MC, USA, Walter Reed Army Hospital, Wash ington, D C One of the features of the meeting will be a round table discussion of the military aspects of dermatology, conducted by several of the leading specialists in this field The one day session has been scheduled in conjunction with the yearly meeting of the American Academy of Dermatologists and Syphilologists

The group, which includes 32 physicians of the Armed Forces and the U S Public Health Service, publishes the quarterly *Bulletin of the Association of Military Dermatologists* Colonel Robert E Lyons, USAF (MC), Lackland Air Force Base, Tex , is editor of this publication

In addition to Colonel Piper, the officers of the association are Captain Robert L Gilman, MC, USN honorary president, Captain William N New, MC, USN, first vice president, Colonel Raymond M Williams, MC, USA, second vice president, Walter Edmundson, M D , USPHS, third vice president Donald Bir mingham, M D , USPHS, fourth vice president, Captain Charles D Bell, MC, USN, fifth vice president, and Lieutenant Colonel Carl K Kaufman, USAF (MC), Parks Air Force Base, Calif , secretary treasurer

REACTIONS TO PENICILLIN GIVEN ORALLY IN MASS PROPHYLAXIS

CLAUDE B WHITE *Col n l USAF (MC)*

ALLERGIC reactions to penicillin have received wide publicity during the past decade Until recently this drug has been admini tered usually either parenterally or topically Kitchen and Rein have reported that the total penicillin reactions following intramuscular injections for syphilis at the New York University Bellevue Medical Center for the years 1947 1948 1949 and 1950 were 4 65 percent, 3 74 percent 3 49 per cent and 3 38 percent respectively Three types of reaction following intramuscular injections were observed (1) an erythematous vesicular or desquamating eruption of the epidermophytid like group (2) simple urticarial reactions and (3) delayed serum sickness like reactions either with or without urticaria More recently a few instances of a more severe type of anaphylactic like shock syndrome[3] have been described

OTHER REPORTS

Topical use of penicillin has been condemned by most American physicians because of the risk of local and systemic sensitization In some American communications hypersensitivity has been reported to occur in from 10 to 20 percent, but European investigators have observed only instances of hypersensitivity in less than one percent of patients The experience of the writer with topical use of penicillin therapy in the military service both in the United States and overseas has been more in accord with the European experience

Little has been reported concerning the reactions following the use of penicillin orally *Babione and his associates believe* that penicillin reactions in the general public and in the U S Navy appear to be becoming more frequent and possibly more severe but available records of persons receiving penicillin orally in the prophylaxis of venereal diseases reveal only 3 reactions in thousands of naval personnel who have used penicillin tablets orally in the past few years The majority of the e

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reactions were considered minor in nature Little sensitivity from prolonged use of these tablets appears to be developing in the Navy According to Keefer,[7] penicillin by mouth causes few or no disagreeable side reactions and the incidence of hypersensitivity is less than when it is given intramuscularly

In January 1953, an oral penicillin prophylactic program was instituted on a mass scale in an overseas area of high venereal disease incidence The purpose of this communication is to report the reactions which have been detected Preliminary samplings of this large group of young men revealed that about 75 percent previously had received penicillin for miscellaneous ailments

PROCEDURE

Penicillin tablets (Stock No 1 606-799, Armed Services Catalog of Medical Materiel) were dispensed on a strictly voluntary basis by medical corpsmen at the main gates of two large military installations Although esthetically objectionable and despite inadequate physical facilities for such dispensing, the program was favorably received by the men even without preliminary indoctrination or publicity The dosage was 500,000 units of penicillin given in two tablets with a cup of water The tablets were swallowed at once, and this was witnessed by the medical corpsmen This program of dispensing penicillin to troops was continued for 45 days with an individual limit of three prophylactic treatments per week. During this period 11 8 billion units of penicillin were dispensed, and these tablets represented 23,544 separate treatments

Experienced medical officers were invited to participate in this study and were requested specifically to screen all incoming dispensary patients for allergic reactions and to refer them directly to the writer for evaluation Their complete co-operation was obtained.

FINDINGS

A painstaking investigation during the 45 days of penicillin administration and for four months after its cessation resulted in the detection of only 21 cases of allergic reactions believed to be due to the ingestion of the tablets A significant number of men were known to have taken as many as 18 separate treatments of 500 000 units each during the 45 days There were others known to have been repeaters but to a lesser extent

The reactions were (1) eight patients with simple urticaria, (2) six with serum sickness like with urticaria (3) three with erythematous and vesicular eruption and (4) four with erythematous and urticarial, id like eruption, localized in the palms They represent an incidence of allergic reactions of less than 0 08 per-

cent per prophylactic treatment and comprise approximately 0 18 percent of all persons taking penicillin tablets

All reactions were minor in comparison with the usual type seen following the administration of penicillin intramuscularly Only one patient with generalized urticaria required relief from duty No patients were hospitalized Their treatment consisted of a bland lotion observation, judicious neglect and, occasionally, an antihistamine drug The majority of reactions cleared up completely in from two to three days The serum sickness like reactions with joint manifestations usually cleared in a week The onset of the reaction varied from one hour after ingestion of tablets up to 10 days Seventeen of the 21 patients stated they had been given penicillin intramuscularly previously Eleven patients had a history of previous allergic reactions, nine from penicillin administered intramuscularly and two from the oral use of sulfadiazine Two patients reinforced a minimal reaction by continuing to use penicillin tablets but other than prolonging the duration of their eruption, little harm evolved

SUMMARY

Only 21 reactions were encountered in a large group of young men following 23 544 separate prophylactic treatments each of 500 000 units of penicillin by mouth All reactions were relatively minor and none required hospitalization In this study, penicillin by mouth produced practically no significant reactions and it appears that this method of administration merits more extensive use

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PREVENTION OF AIRSICKNESS DURING TRAINING FLIGHTS

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IT has been shown that a mixture of 0 33 mg of scopolamine hydrobromide and 25 mg of diphenhydramine hydrochloride (benadryl) affords good protection against airsickness with relatively few side effects [1 2] The sedative action of this preparation, although less than that of most effective prophylactics, is none the less significant [2] The addition of an analeptic could be expected to decrease this effect and might, therefore, prove a useful adjunct Because the palliative action of motion sickness prophylactics is thought by many to depend in part on their soporific ability, it was first necessary to determine whether stimulation of the central nervous system produced less protection With this in mind, dextro-amphetamine sulfate (dexedrine sulfate) was added to the benadryl scopolamine hydrobromide preparation and compared with the unsupplemented mixture during routine training flights 10 (2 diethylamino 1 propyl)phenothiazine (parsidol hydrochloride) and Schering formula No 1667 were included in this series because preliminary testing against seasickness indicated a promising degree of protection Finally, Wyeth formula 46062* was combined with scopolamine hydrobromide to determine whether the known effectiveness of the individual constituents could be retained at reduced dosage levels

EXPERIMENTAL TESTS

Two separate tests are described in this article In the first study, air navigation trainees were used as subjects during their regular training flights in T 29 aircraft (modified DC 3), as reported in a previous study [2] The average age of this group was 25 4 years and, with few exceptions, all had had considerable flying experience The following substances were prepared in identical capsules (1) placebo (2) 25 mg of parsidol hydro-

From U S Air Force School of Aviation Medicine Randolph Air Force Base Texas

The compound ethyl) phenothiazine and combination of two drug phenergan [N-dimethylamino-2 methyl-ethyl) phenothiazine] and ephedrine [N-(d methylamino-1 methylethyl) ethyl

chloride (3) 25 mg of benadryl with 0 35 mg of scopolamine hydrobromide and (4) 25 mg of benadryl with 0 35 mg of scopolamine hydrobromide and 5 0 mg of dexedrine sulfate One capsule was given at random to each of the subjects from 30 to 60 minutes before take-off The flights ranged from 2 to 1° hours the average being about 5 hours

The second group consisted of male and female student officers and airmen flying as passengers in C 47 aircraft on routine training flights of simulated air evacuation missions The average age of the officers was approximately 27 years and of the airmen 22 years Originally the flights were scheduled in the morning and the students attended classes in the afternoon Because many of the subjects claimed it was difficult to keep awake during afternoon classes following a training flight the flights were later scheduled during the afternoon hours The flights were from one to two hours and most were made during relatively calm weather Thirty percent of the passengers had no previous flight experience

Questionnaires from both groups were completed immediately after landing The incidence of nausea and vomiting is shown in table 1

In view of the extensive flying experience of the navigation trainees it is not surprising that the incidence of nausea and vomiting among them is rather low None of the drugs gave protection against vomiting at the five percent confidence level although both the benadryl scopolamine hydrobromide and the benadryl scopolamine hydrobromide dexedrine sulfate mixtures gave indications of a decreased vomiting rate When the incidence of frank vomiting was added to that of severe nausea both of these preparations afforded significant protection This protection became even more obvious when all grades of nausea were combined and its total incidence was compared with those who received the placebo Parsidol hydrochloride did not afford protection at a statistically significant level ($P = 0.13$) but the tendency in this direction suggests that a larger series might reveal a true prophylactic effect The side effects were slight The anhidrotic effect of the benadryl scopolamine hydrobromide combination with or without dexedrine sulfate was evident by the decreased sweating reported and the increased incidence of dry mouth The only other significant variation from the placebo group was the decreased incidence of fatigue with both benadryl scopolamine preparations This is probably a reflection of the lower rate of airsickness in these groups The incidence of drowsiness was slightly lower in the dexedrine sulfate-supplemented group than in the other three groups although not at a significant level

TABLE 1 *Effectiveness of various drugs*

Drug	Dose (mg)	Number of subjects	Mild nausea (percent)	Severe ns (percent)	Vomiting (percent)	Total (percent)
Placebo		172	12 2	2 9	6 4	21 5
Pyrsidol hydrochloride	25 0	172	8 7	0 5	5 8	15 1
Benadryl Scopolamine hydrobromide	25 0 0 35	174	2 8	0 6	2 8	6 3
Benadryl Scopolamine hydrobromide Dexedrine sulfate	25 0 0 35 5 0	179	4 4	0	3 4	7 8
Placebo		183	14 2	1 1	2 2	17 5
Schering formula No 1667	25 0	187	15 0	1 6	1 6	18 2
Wyeth formula No 46062	25 0	190	9 5	1 6	0	11 1
Wyeth formula No 46062 Scopolamine	15 0 0 35	174	8 0	0 6	3 5	12 1

Significantly different from placebo $P < 0.01$

The incidence of nausea and vomiting among the second group of subjects was too low to permit detection of significant prophylaxis In harmony with previous findings, Wyeth formula No 46062 provided apparent protection although not at a significant level (P - 0 08) A decreased dose of this compound combined with scopolamine hydrobromide also failed to give protection (P - 0 15)

DISCUSSION

Although neither the sedative character of the benadryl scopolamine hydrobromide mixture nor its antagonism to dexedrine sulfate was apparent in the present study, both of these actions have been shown unequivocally by objective measurements It is important however, to bear in mind that the action of dexedrine sulfate in increasing wakefulness is not necessarily *an unmitigated advantage Payne recently has shown that dexedrine* sulfate added to a benadryl scopolamine hydrobromide mixture actually decreased the job performance of air navigation students Because such a stimulation did not noticeably impair the capacity of the original preparation to prevent airsickness there is hope that a better protective mixture may be evolved.

SUMMARY

A mixture of 25 mg of benadryl and 0 35 mg of scopolamine hydrobromide gave good protection against motion sickness both with and without the addition of 5 mg of dexedrine sulfate No significant difference in prophylaxis between the two groups of subjects were detected The following preparations failed to afford significant protection. parsidol hydrochloride (25 mg) Wyeth formula No 46062 (25 mg) Schering formula No 1667 and Wyeth formula No 46062 (15 mg) plus scopolamine hydrobromide *(0 35 mg)* The *side* effects were slight The significance of adding an analeptic drug to combat the sedative effects of motion sickness preventives is discussed

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A HYPERTENSION AND DIABETES DETECTION PROGRAM

FELIX P KEANEY *Captain MC USN*
JOHN G STUBENBORD *Commander MC USN*
MARVIN M McLEAN *Commander MC USN*
FRANK A BOVE *Lieutenant MC USNR*

THE early detection of disease is the essential first step in preserving the worker's physical capacity so that his experience and skills can be retained by industry Our aging population is faced with the threat of chronic degenerative disease, which often is insidious in onset, mild and even relatively asymptomatic in actuality, but tremendously costly in man hour loss and in impairment of working efficiency Such diseases as diabetes mellitus and hypertension fall into this category

It has been pointed out that there are many diabetics who go undetected year after year [1-6] These, if discovered, probably would be most amenable to treatment, the majority being mild, symptomless cases and those of recent onset

Diabetes or hypertension may go unrecognized until some major catastrophe, such as loss of vision from diabetic[7] and/or hypertensive retinopathy,[8] beginning gangrene of a foot, a cerebral vascular accident, or a coronary thrombosis, occurs [9-11] The fact that vascular complications of diabetes are increasing, especially in the older age groups, is quite evident from the literature [12-14]

The unfortunate part of the situation is that these degenerative diseases are progressive once they are well established, in spite of the best therapy and most vigorous management possible [7] Our hope is to find these diseases in their incipiency before they cause symptoms or become associated with degenerations of the vascular tree and then to treat the patients with the best of medical armamentaria Of course, in industrial medicine this latter objective of vigorous therapy is left to the employee and his physician of choice Our main objective in public health remains to seek out these diseases, bring them to the attention of the worker, and encourage him to seek proper medical care

From U S Naval Shipyard Dispensary Philadelphia Pa

DETECTION PROCEDURES

It has been an annual procedure to make roentgenograms of the chest of all civilian workers in the shipyard More than 10 000 have been examined so far this year Heretofore this was the only mass survey for the detection of disease conducted by the dispensary among the civilian personnel but because hyper tension and diabetes lend themselves readily to mass survey technics these have now been added to the preventive medicine program Checkups for hypertension and diabetes were given to 5,250 workers

The following procedure is being employed We arbitrarily se lected the group age 50 and over to begin the survey so that our facilities would not be overtaxed, but have since included all those of age 40 and over The entire civilian personnel eventu ally is to be included in the study which will be a continuing one from year to year

Each worker has a chest roentgenogram (70 mm photomicro-graph) and if he is in the age group 40 or over his blood pressure is taken using a mercury sphygmomanometer A urine specimen is then collected The entire procedure of roentgenography blood pressure determination and collection of urine takes about 15 minutes

The qualitative Benedict test for glycosuria used to be per d on the urine specimen but we have replaced this with the "clinitest" type in order to speed up the procedure The number of urinalyses performed daily for this survey has been about 900

CASE FOLLOW UP

Workers with a systolic blood pressure recording of 150 mm Hg or higher or a diastolic pressure of 90 mm Hg or higher are recalled to the dispensary for an interview There is no universal agreement as to the dividing line between normal and high blood pressure but most authorities refer to a diastolic pressure above 90 mm Hg as hypertension and as a rule, the systolic blood pressure is considered elevated when above 140 mm Hg Ac cording to these criteria, 12 percent of the workers examined exhibited hypertensive readings This is in agreement with the incidence of hypertension in the general population which is reported to be from 2 to 25 percent

The interviewing of the worker considered to be hypertensive is arranged at a time convenient for us and suitable for the par ticular shop in question He is told that his blood pressure was found to be elevated and rechecks are made if indicated An swers to questions about his condition are made a part of his clinical record (chart A) If the blood pressure is very high (200

CHART A *Hypertension detection drive—civilian workers age 50 and over U S Naval Shipyard Philadelphia Pa*

Date	Name	B dg	Sh p	Age	Known hyper t nsion	Blo d pressure	Physician	Symptoms	Signs	Family history	Follow p
2/53	J C	No	—	62	Yes	190/100	None	Occipital headaches dizzine s	None	Negative	To check with his local physician

mm Hg or over systolic 110 mm Hg or over, diastolic) he is given a heart examination which in selected cases includes an electrocardiogram and a urine albumin test

An effort is made to change his job status if it is deemed advisable The worker is told to see his physician and to present evidence that he is actually under treatment (i e a note from his private physician) About half of the hypertensive workers had not realized that they had an elevated blood pressure, and almost half of the group who were unaware of it had not seen a family physician in six months By contrast only about five per cent of those who knew that they had hypertension were without a family physician

Although 80 percent of the hypertensives declared that they had no symptoms of any kind it is our impression that this figure is high because of their reluctance to admit their symptoms for fear of losing or changing their job status The 20 percent who did admit symptoms had those commonly encountered in hypertensives The data collected on hypertensives is tabulated in chart B The highest blood pressure recorded was 248/138 The record of positive family history for hypertension appears somewhat low (10 percent) considering that there is suggestive evidence of a familial tendency to hypertension [3]

As concerns detection of diabetes a repeat urinalysis is done routinely for all cases of glycosuria and the worker is interviewed Questions are asked concerning age symptoms of diabetes whether he knew that he had glycosuria whether he is under a physician s care and whether there was diabetes in the family He is examined for signs of diabetes including examination of the lower extremities for peripheral vascular disease This is recorded (chart C) and notes are made in his clinical chart A blood sugar sample taken two hours after a test meal (chart D) is then examined by our laboratory and the results are given to the patient with instructions to see his physician Diabetic patients are requested to have their own physician fill out the *Diabetes Medical Report of the U S Civil Service Commission* (Form 3684 June 1945) which becomes part of the case record

Of the 99 interviews made in those men with glycosuria 49 have been considered either diabetic or potential diabetics [4] These latter patients were those with blood sugar levels between 150 and 170 mg percent after a test meal and with a family history of diabetes or signs and symptoms of the disease Chart E reveals that of 30 newly discovered diabetics, nine had no symptoms and might have gone undetected for some time The majority of the known diabetics apparently were under satisfactory control

CHART B *Results of recheck for hypertension*

Blood p ur ng 150/90 to 248/138

Age group 40 to 69

	N mber inter viewed	Number under physi ci n s care	No physi cian at pres nt	Number without symp t ms	Number with symptoms										Po iti e family hi tory f r hyper tension
					Dizzi ness	Head aches	Blurred vision	Uri n ry fre quency	Short of breath	Tinni tus aurium	CVA	Γpi staxis	Marked obesity	An gina pec toris	
K wn hyper t es	265	252	13	202	20	28	0	0	2	2	1	10	3	1	42
Unknown hypert s e	365	164	201	317	14	22	2	2	0	0	0	3	1	0	21
Total	630	416	214	519	34	50	2	2	2	2	1	13	4	1	63

Cerebrovasc lar acc dent

CHART C D b t d t t drive—c luan o ke ag 50 nd ove U S Naval Sh pyard, Phlad lph a, Pa.

D	N m	B dg	Sh p	Ag	K w d b	Phy	Symp m	S g	F m ly h t ry	U	F ll w p
1/26/53	A E H	N ----	---	65	N	D --------	P lyd p p lyph g ur w h m	L t 15 lb p y P ph ral p l pal p bl	N g	S g 4	R p ur naly 4 Bl d g (w h ur) 196 mg p L l phy p p t d t d l

CHART D T t br k/ast

W gh (gr m)	F od	H h ld m ur	P	F	Ca bo- hyd
200	Or g l	1 gl	2	0	21 6
18	C fl k	¼ p	2	0	18
60	20 pe m	⅓ p	2	12	2
10	S ga	2 p	0	0	10
30	B	3 p	6	18	0
100	Egg (mbl d)	2	12	12	0
24	B	2 p	0	20	0
60	B d	2 l	7	0	31
	C ff	1 p	0	0	0
10	S ga	2 p	0	0	10
			31	62	92 6

CHART I. *Results of recheck for diabetes*

	Number interviewed	With symptoms (polys weight loss pruritus, etc.)	Without symptoms	Blood sugar range (two hours) in mg percent	On insulin therapy	Positive family history
Known to be diabetic before survey	19	6	13	160 to 303	6	5
Unknown to be diabetic and considered diabetic as result of survey	30	21	9	165 to 476	--	4
Exhibiting glycosuria without diabetes	50	12	38	67 to 123	--	1
Total	99	39	60		6	10

All the diabetics encountered, both the known and the newly discovered were re-evaluated as to job hazards and those taking insulin have been disqualified for any job except ground work A family history for diabetes was found in only 10 percent This is low considering that it has been estimated that perhaps 35 to 50 percent of diabetes is familial Whereas in the general population glycosuria has been found in from one to three percent [4] we have found glycosuria in six percent and diabetes in three percent of the total number of men examined

We believe that much can be done by guiding these diabetic and hypertensive patients in seeking proper medical care to keep them physically fit and to prolong their life expectancy

SUMMARY

A hypertension and diabetes detection program at the U S Naval Shipyard Naval Base Philadelphia Pa includes a detailed plan for examinations interviewing and disposition of cases Checkups for detection of hypertension and diabetes were given to 5,250 shipyard workers Hypertension was found in 19 percent and diabetes mellitus in 3 percent of the workers examined

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Emotions and Skin Diseases

ommonly encountered emotions such as insecurity anxiety hos y and guilt may cause stimulation of the autonomic nervous sys leading to flushing, sweating itching and excoriation Physical nts through which emotions mediate these effects are acetylcholine ased at parasympathetic nerve fiber endings sympathin produced sympathetic stimulation synergism between acetylcholine and his ine and the mechanical and allergic effects of sweat retained under sure

everal skin disorders believed to be of emotional origin exhibit ly characteristic personality patterns An effort has been made to te the clinical entity to the emotional pattern in herpes simplex icea urticaria, childhood eczema, adult neurodermatitis, and local d neurodermatitis In most such cases it is desirable that one phy ian supervise both the somatic and psychic aspects of therapy ictional dermatoses such as delusions of parasito is yphilophobia matitis factitia and neurotic excoriations result from deep seated roses or psychoses and should be referred to the psychiatrist for atment

—GERALD M FRUMESS M D
in the *Journal of the American Medical Assoc ation*

Regular Medical Corps Officers Certified by Specialty Boards

The American Board of Otolaryngology

Activated in 1924 the American Board of Otolaryngology is the third largest of the specialty boards being surpassed only by those of internal medicine and surgery According to information received from the Offices of the Surgeons General of the three military departments the following 55 regular officers have been certified in this specialty

J h E Al xand *Lt C l USAF*
W ll E All *C mdr USN*
W lliam F And w *Maj USA*

Al d H B on *C pt USA*
P ul F B ksh J M j *USA*
Cl nc J B w *R ar Adm USN*
H nry G B llw k l *Capt USN*

Glen S Campbell *Capt USN*
P l A Campbell *C l USAF*
S m l L Cook *Col USA*

J ll on Da *Comdr USN*
Adria J Del ney *Capt USN*
R bert E D gl *C mdr USN*

V rn J Erk be k *C l USA*

F lix C F m *Lt Col USA*
Shi ley A. Fuh g *Comdr USN*

R h d A. Ga ll rd *Comdr USN*

F d Harb rt *Capt USN*
F d k L H ourt *M j USA*
Theodor L Ha tr dge *Lt C l USA*
D k A H *Capt USN*

L wis G J d *Capt USN*

Leroy L K y *Comdr USN*
Norma E K g *Lt C l USA*
R lph N Kr us *Lt Col USAF*

W tson B La k *Comd USN*
B uc V L me *Capt USN*
J me E L *Lt Col USAF*

D nald G M K on *C mdr USN*
Byr G M K bben *C l USA*
O P M ll *Lt Col USA*
Eug H Moyl *Capt USN*
H nry S Murph y *C l USA*

Edga L Ol on *C l USAF*
J hn Q Ow l y *R ar Adm USN*

F k A P *Lt C l USAF*

R be P R *C l USA*
J h B R ddy *Lt C mdr USN*
Fra W R g r *Col USA*

F k J Shaff *C l USA*
K h S m *Lt C l USA*
F kl L Sp *Lt C l USA*
Le l O S *R ar Adm USN*
Cliff d A Swa *R ar Adm USN*

Hyma Turn *M j USA*
N m A Tw gge *M j USAF*

A bo y J V d la *C l USA*

W nd ll A. W ll *Col USA*
Edwa d J Wh l y *Lt C l USA*
Leroy E W bl *Comdr USN*
O W Wick tr m *Capt USN*
Mort m L W lliam *Capt USA*
Edgar D W pp rm *Maj USAF*

J k O Yeag *Lt Col USA*
Cl f o A Y g *Capt USN*

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VERTICAL TRACTION IN OPEN FRACTURES OF THE FEMUR

HOWELL E WIGGINS *Commander* MC, USN

OPEN fractures of the femur present a problem in operative management and in providing traction, because the usual position of the extremity on an operating or special orthopedic table does not provide circumferential access to the thigh The so-called "90-90 90" vertical traction was devised by Obletz[1] as an aid in management and as a temporary method of traction.

Essentially, the method consisted of exerting suspension traction on the femur while the hip, knee, and ankle were flexed to 90 degrees In addition to the obvious advantage of permitting ready access to the wounds, there are other less obvious advantages Alinement of the fragments is obtained readily and without difficulty This is particularly noticeable in fractures of the proximal and distal thirds of the femur, where flexion, abduction, and external rotation of the proximal fragment in the former, and flexion of the distal fragment in the latter make these the most difficult of all femoral fractures to treat by traction, utilizing conventional methods In addition, compression dressings may be applied without the possibility of disturbance of alinement, portable roentgenograms may be taken in both planes without the presence of radiopaque splints and bars on the film, nursing care is greatly simplified by the absence of the perineal ring, the patient is comfortable, and there is no necessity for constant observation on the part of the nursing staff to prevent maladjustment of traction and alinement

CLINICAL TRIALS

Although Obletz made no mention of the use of vertical traction in the treatment of bilateral femoral fractures, the method appeared to be an ideal one for the handling of this complicated injury The multitude of splints, attachments, pulleys, and weights necessary to provide balanced traction in these cases makes nursing care difficult. Between 1947 and 1949, two patients with bilateral fractures of the femur were treated by vertical traction and the results were so gratifying that this method was adopted to the exclusion of all others when traction was required in this type of injury These patients were suspended in vertical

From U S Naval Hospital Philadelphia Pa

traction for a period of 8 and 9 weeks, respectively Beginning at the fourth week, both patients were given passive knee exercises, and at the sixth week were allowed to exercise their knees actively through the range of motion permitted by the apparatus When the femurs were demonstrated to be clinically sticky and there was roentgenographic evidence of callus formation a gradual diminution of hip flexion was begun with concomitant extension of the knee This may be accomplished by moving the traction pulley distally in conjunction with lowering the calf sling, or by a shift to the Thomas splint with Pearson attachment

This experience prompted our use of the vertical traction method as the major traction method in a series of 21 open fractures of the femur In none of these patients were the complications mentioned by Oblotz encountered viz stretching of the quadriceps tendon or patellar ligament contracture of the hamstrings or fixation of the patella The only complication that was observed was the development in one patient of an abscess on the lateral aspect of the thigh near the greater trochanter This was undoubtedly due to dependent drainage from the site of compounding The abscess required drainage following which all local symptoms promptly subsided It should be pointed out however, that this same complication may occur in conventional traction where the thigh is invariably maintained in a flexed ition It is also my impression that fractures of the femur by vertical traction require a little longer to exhibit roentgenologic evidence of adequate callus formation than those treated with conventional traction although with my limited experience with the method I cannot confirm or deny the impression

REPORT OF A CASE

A 20-year-old man was admitted with an open comminuted fracture of the right femur at the junction of the proximal and middle thirds the injury having been sustained during enemy action 2½ weeks prior to admission The anteroposterior and lateral roentgenograms of the right femur in plaster on his admission to this hospital are reproduced in figures 1A and 1B The cast was removed and the patient placed in 90-90-90 traction Figures 2A and 2B are anteroposterior and lateral views respectively of the fracture two weeks later Figure 3 illustrates the technic of traction and the position of the extremity Conversion to a Thomas splint with Pearson attachment and gradual extension of the knee was begun during the eighth week in 90-90 90 traction Six months after the injury there was clinical and roentgenographic evidence that the extremity was sufficiently stable to allow ambulation in an ischial weight-bearing caliper brace The patient was returned to a limited duty status about 11 months after the original injury

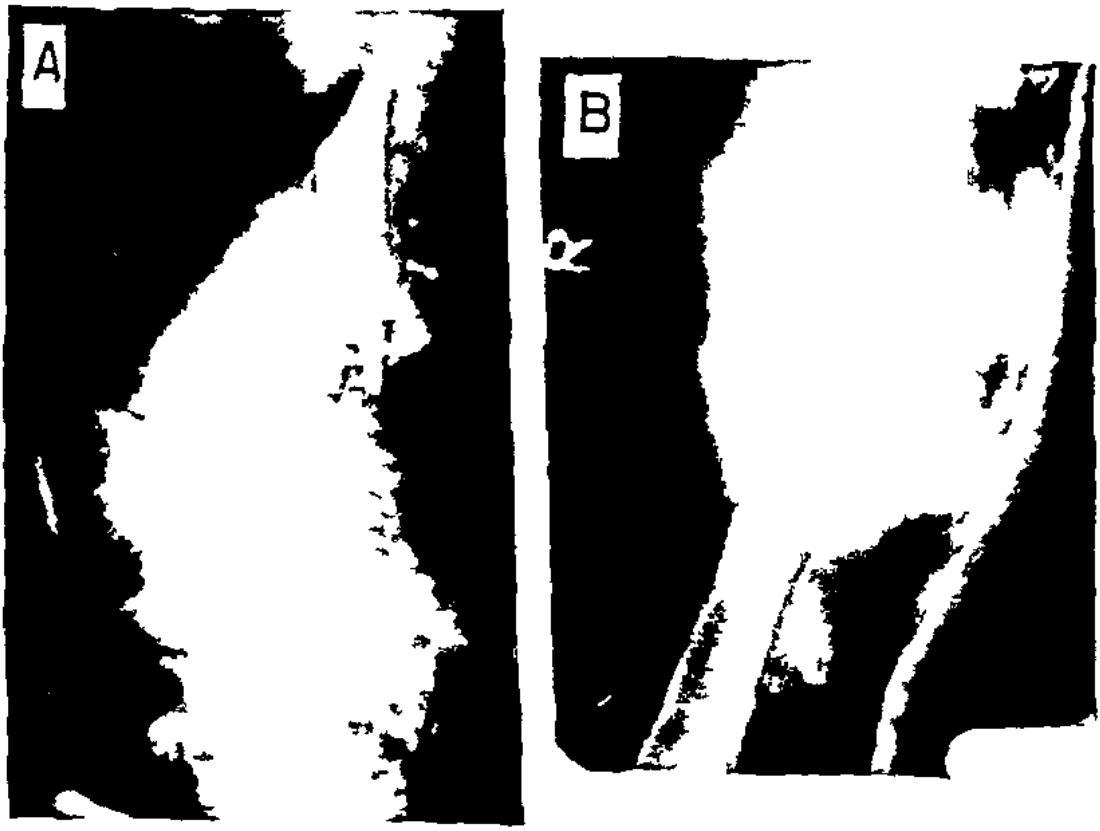


Figure 1 (A) *Anteroposterior and* (B) *lateral roentgenograms of the right femur in plaster on admission to our hospital.*

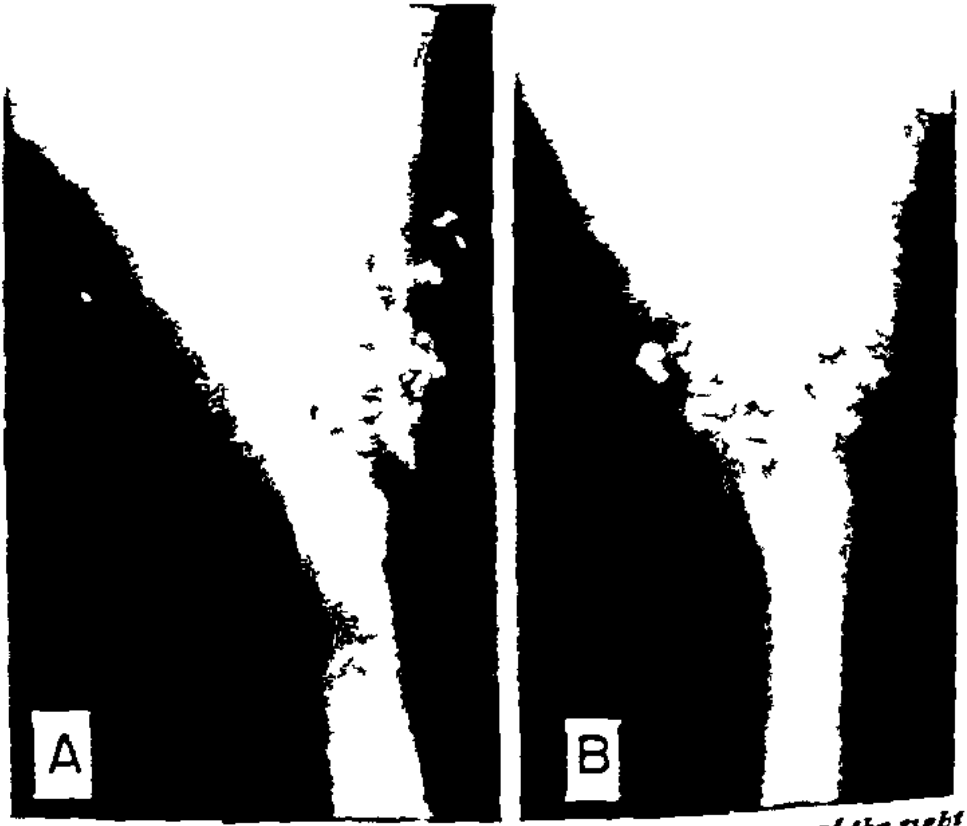
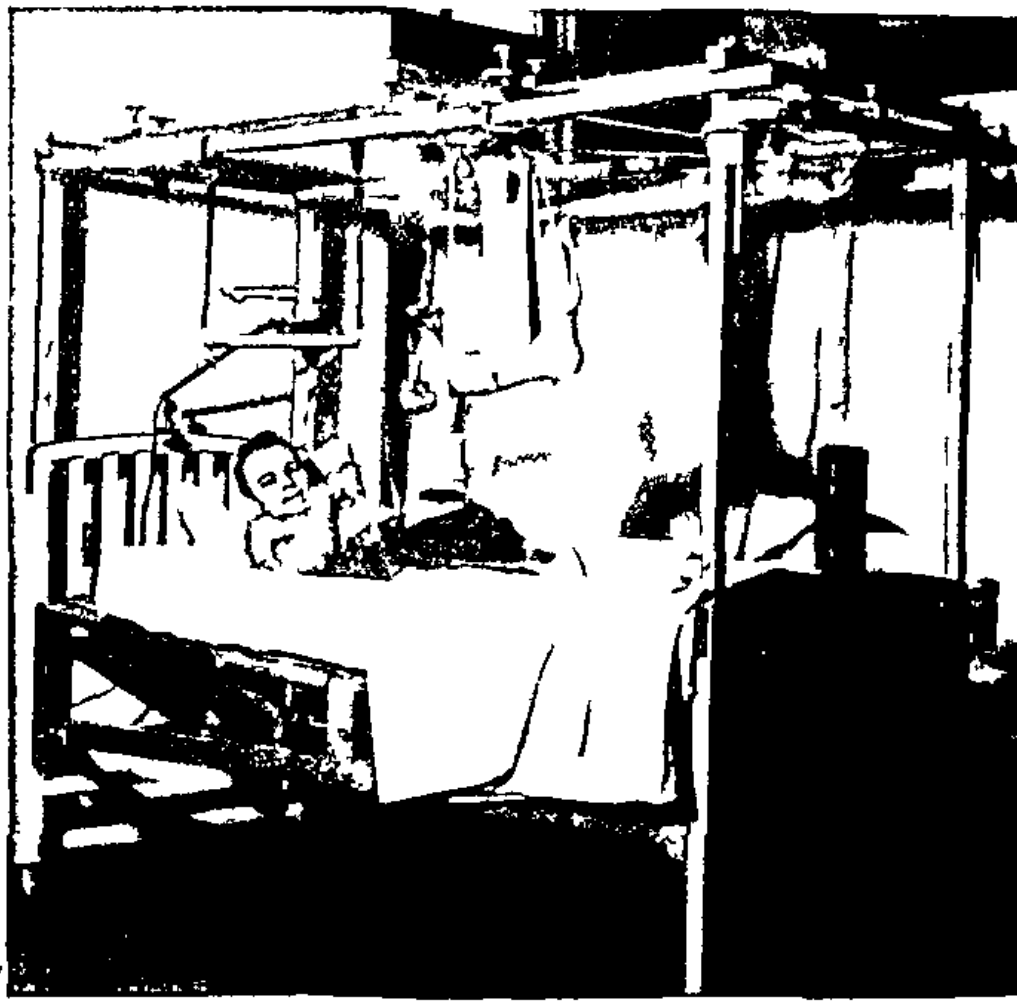


Figure 2. (A) *Anteroposterior and* (B) *lateral roentgenograms of the right femur two weeks after suspension vertical traction.*



Figur 3 The te b sc of 90-90-90 tra tion nd po itio g of the xtremity

CONCLUSIONS

Vertical traction offers advantages in the management of dif ficult femoral fractures, without producing serious complications Its use is suggested in selected cases

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OSTEOARTHROPATHY AND SIMPLE CLUBBING

JOHN T LOGUE *Captain USAF (MC)*

ONE case of chronic idiopathic hypertrophic osteoarthropathy and two other cases of simple clubbing of the fingers and toes in brothers have been observed during the past year These patients are of interest because they are otherwise healthy servicemen who became aware of their condition only because of the gradual appearance of marked clubbing of the fingers and toes The first patient showed evidence of advanced bone disease on roentgenologic examination but had experienced only minimal clinical symptoms The second showed the marked soft tissue changes associated with this disease with only slight roentgenologic evidence of bone disease, and his brother had clubbing to a lesser degree without roentgenologic evidence of bone disease

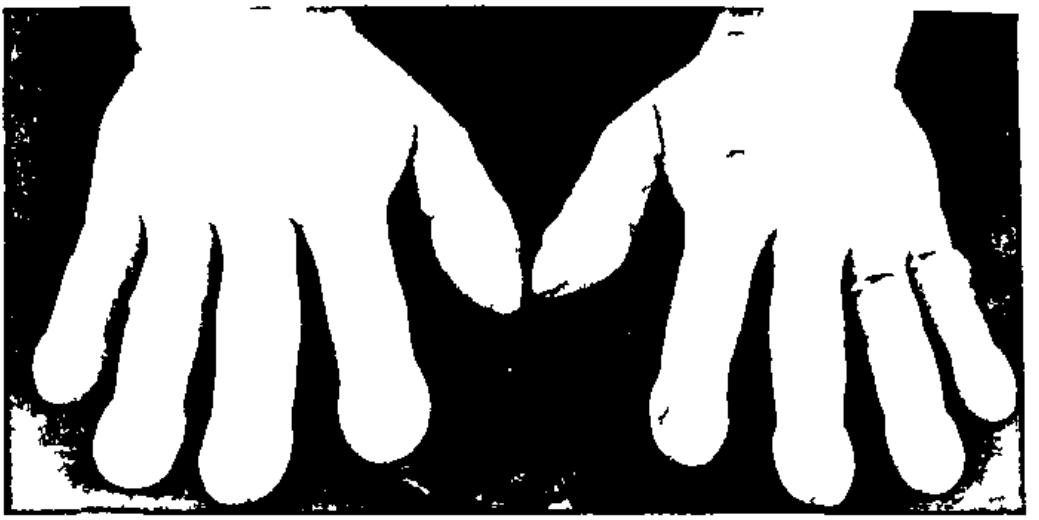
CASE REPORTS

Case 1 This patient is a 35 year old man who first noticed pain, swelling and increased heat of the wrists, ankles, and the interphalangeal joints in 1941 while on duty in Puerto Rico He was treated with bed rest and salicylates He became symptom free after five weeks and was returned to full military duty He first noticed progressive clubbing of the fingers and toes during the period of bed rest. A chest roentgenogram was normal but bone films were not taken The patient has been asymptomatic except for one transient episode of pain, swelling, and increased heat in the right wrist. He has had no disability except the inability to bowl properly because of the size of his finger tips

The patient is married and has one normal child His past history is not significant Physical examination revealed a healthy appearing man with marked clubbing of the fingers and toes and with swelling of both ankles, especially marked over the medial malleoli There was no limitation of motion in any joint although crepitus of both ankles was present The skin was coarse and deeply creased over the finger joints

Chest and skull roentgenograms were normal Roentgenograms of the spine showed early hypertrophic changes of both sacroiliac joints and of the anterior and lateral aspects of the lumbar vertebral bodies The borders of the medial condyles of both tibias

From U S Air Force Hospital Rhein/Main Air Base Germany



F g re 1 (I) Photograph hou e la g m t f f ge d e t de lyi g x t of d tal phala g

showed slight periosteal proliferation The patellas revealed areas of decreased calcification surrounded by areas of hyper trophic bone Both medial malleoli were enlarged and showed multiple exostoses with osteoporosis of underlying bone The lateral aspect of the head of the first left metatarsal bone was completely separated There was soft tissue enlargement of all finger tips (fig 1) with multiple exostoses of the distal phalanges An electrocardiogram basal metabolic rate, and routine labora tory tests were normal

Case ° This man is 25 years old with a lifelong history of marked clubbing of both fingers and toes without pain swelling



Figur 2 (c se 2) Thi patient pr nt d clubb g of the finge s.

or increased heat in any joint His past history includes measles, mumps, and bilateral pneumonia at the age of seven years with full recovery His father has thick, curved fingernails, but the presence of clubbing was undetermined His brother has clubbing of fingers and toes but to a lesser degree than this patient.

This patient was first hospitalized in March 1951 because of recurrent headaches Roentgenograms of the skull, electroencephalograms, and examination of the optic fundi were said to be normal In June 1951, he was admitted because of morning cough and clubbed fingers The chest roentgenogram, bronchoscopy, and bronchograms were normal, and the patient was returned to full military duty At this hospital in 1952, his general physical

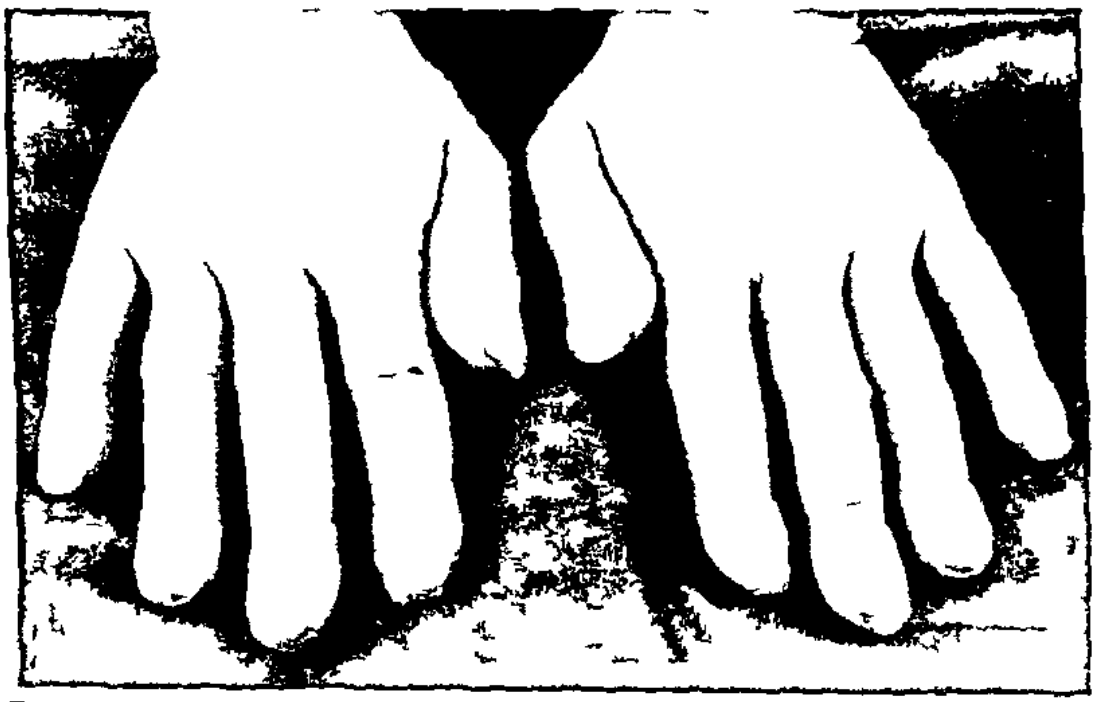


Figure 3 (case 3) This patient is a brother of patient 2 with clubbing of fingertips.

examination was within normal limits except for marked clubbing of both fingers (fig 2) and toes On roentgenologic examination the tips of all fingers showed marked soft tissue swelling but the ungual tufts distal phalanges and articulations of all joints were normal The long bones showed no signs of periosteal proliferation. The shafts of the first proximal phalanges of his feet showed small lateral spurs with some thickening of the periosteum over the diaphyses Laboratory tests were normal.

Case 3 This patient is a 24 year-old man, brother of patient 2 who has been well all his life except for swelling of his fingertips (fig 3) The general physical examination and clinical findings were within normal limits Roentgenograms of the chest skull, and bones were normal

DISCUSSION

Chronic idiopathic hypertrophic osteoarthropathy and clubbing of the fingers and toes are generally considered as manifestations of the same pathologic process The bone changes of hypertrophic osteoarthropathy and the soft tissue changes of clubbing are tissue responses to stimuli which have not been fully described but references to these changes date from the time of Hippocrates in the fifth century B C The onset or acceleration of these changes during adolescence and the superficial resemblance of these changes to acromegaly point to hormonal activity as the cause of these conditions Fried first suggested that a hormonal imbalance between the lungs and the pituitary gland might result in hypertrophic pulmonary osteoarthropathy and Bloom reported a case of carcinoma of the lung with metastasis to the pituitary gland The association of gynecomastia in these patients also supports a possible endocrine imbalance as underlying these changes Mendlowitz[3] believes that increased peripheral blood flow is a causative factor in hypertrophic pulmonary osteoarthopathy and that this should aid research into the pathogenesis of hypertrophic osteoarthropathy and clubbing An increase in peripheral blood flow however is not present in many of these patients Camp and Scanlan conclude that hereditary predisposition is a prime causative factor in the development of this disease because there is familial involvement in about 60 percent of the reported cases Carruthers reported two brothers with hypertrophic osteoarthropathy and clubbing somewhat similar to those reported in this communication A full understanding of the pathogenesis of these changes seems to be as elusive as it was when Marie first described these changes in 1890

Chronic idiopathic osteoarthropathy is similar in many respects to syphilitic osteitis rickets, osteitis deformans and acromegaly One should not experience any difficulty however in differentiating hypertrophic osteoarthropathy from these other bone diseases because of its characteristic roentgenologic appearance

The roentgenologic features of this disease are characteristic and consist of slowly progressive ossifying periostitis beginning in the distal end of the diaphysis and later involving the entire shaft of the bone The tibias fibulas radii ulnas femurs humeri, metacarpals and metatarsals are most frequently involved The terminal phalanges may become hypertrophic but as the disease progresses atrophic changes may result in varying degrees of osteoporosis The roentgenologic picture of chronic idiopathic osteoarthropathy is indistinguishable from that of hypertrophic pulmonary osteoarthropathy which may be a secondary complication of congenital heart disease with cyanosis subacute bacterial endocarditis tuberculosis pulmonary suppuration

fibrosis, and pulmonary neoplasm [3 9] Hypertrophic osteoarthropathy may be the presenting symptom of a neoplasm if the onset of clubbed fingers is sudden of short duration [10 11]

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Fat in the Diet

The present high level of fat in the American diet did not always prevail and this fact may not be unrelated to the indication that coronary disease is increasing in this country In the past 40 years the contribution of fats to the total metabolism in the United States has risen by more than 25 percent in the past 20 years the rise has been almost 13 percent In the fact of all the evidence is this situation desirable? One may seriously ask whether the current nutritional and dietetic teaching in this country is as completely on the right track as some may suppose Complete indifference to the amount of the fat in the diet is the attitude currently expressed by both technical and popular books and articles on diet

—ANCEL KEYS M D
in *Journal of The Mount Sinai Hospital*

PALLIATIVE TREATMENT FOR ABNORMALITIES OF THE PALATE AND MANDIBLE IN THE NEWBORN

PHILIP S FAILLO *Major DC USAR*

PREMATURE newborn infants with congenital abnormalities of the mouth and face frequently present serious complicating problems Most frequently these are related to some abnormality in the development or closure of the embryonic fissures but many other types of deformities do not have as definite a basis of origin

Sometime after the fifteenth day of conception the cavity from which will be formed the future mouth and nose is bounded from above by a tubercle projecting from the anterior part of the head or frontonasal process, and on each side by the maxillary processes (fig 1) The mandibular processes join in the midline at about the fifth fetal week and together form the lower jaw or mandible representing the first pair of visceral arches The maxillary processes do not meet in the midline but remain wedged between the frontal and mandibular parts The cavity is then bounded laterally by the maxillary, and from above by the frontal processes and from below by the mandible At about this time on the lower end of the developing frontal process three tubercles appear the central and lateral processes (fig 2) From the frontonasal and the nasal processes the forehead external nose and central part of the lip is formed

The maxillary process is separated from the lateral nasal process by the orbital fissure which extends to the mouth and in the upper part of which the eye is developed The frontonasal and maxillary processes are separated from the lower jaw by a transverse fissure the median part of which will be the future external mouth slit.

Any and all of the typical face clefts are produced by the non closure of any part of the fissures or of the cleft which existed in the midline between the mandibular processes or the medium groove between the globular processes A study of the regional

From 91st Medical Detachment (Dental) U S Army

embryology reveals the variety and extent of defects that are possible.

Many theories have been advanced, but no one definite cause has been established for any single deformity. Various mechanical causes have been advocated, as well as external injury, infection, malnutrition, tumors, and maternal impressions. In some instances of extensive deformities in a newborn infant when a previous injury, malnutrition, or nervous shock occurred during pregnancy it may be difficult to dissociate the two conditions. Heredity is the most significant factor in the incidence of cleft

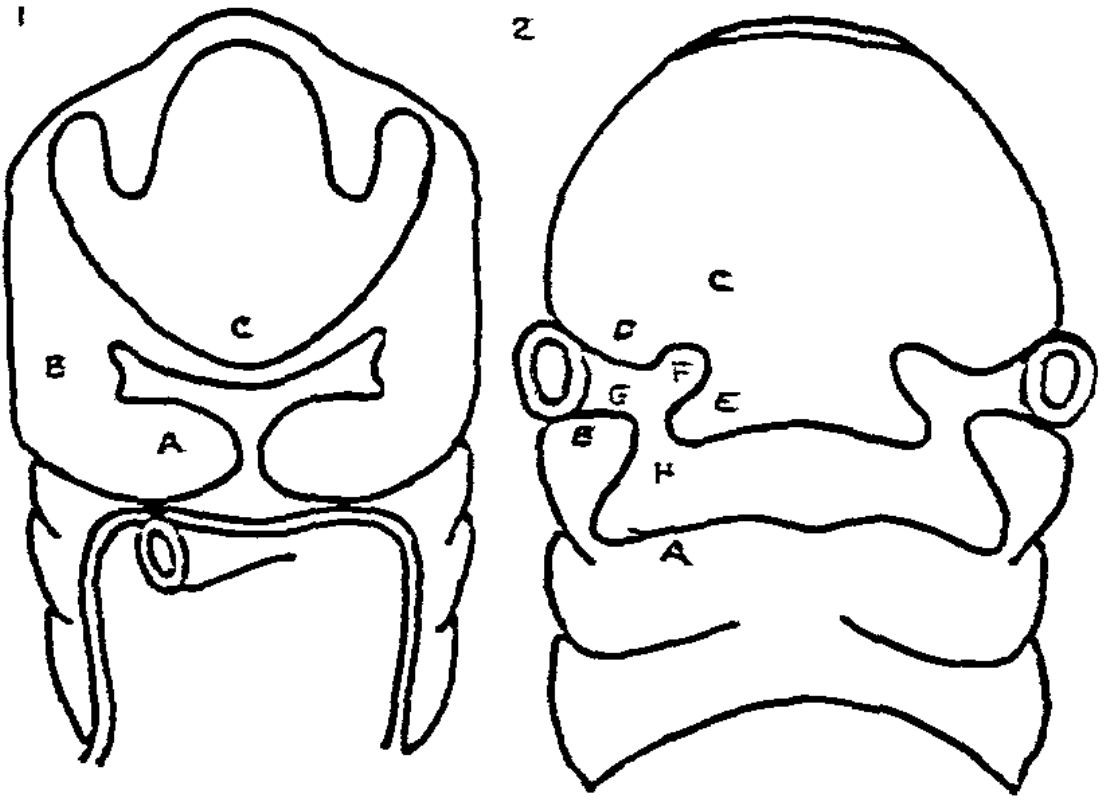


Figure 1 Head of the fetus at the end of fifth week (after His) (A) *Mandibular process* (B) *Maxillary process* (C) *Frontonasal process.* *Figure 2 Head of the fetus in the seventh week (after His)* (A) *The new united mandibular process* (B) *Maxillary process.* (C) *Frontonasal process* (D) *Lateral nasal process* (E) *Globular process attached to the nasal part of the frontonasal process* (F) *Lateral nasal grooves which represent the anterior nares* (G) *Orbital fissure* (H) *Transverse fissure*

lip and palate. Instances of multiple occurrences in the same generation have been noted but the incidence is not high enough to advise an individual family against having other children.

Deformity of the cleft palate may occur in any degree ranging from a slight notch in the uvula to a wide-open cleft extending through the alveolus with bilateral involvement.

REPORT OF A CASE

A seven month old premature infant was born with a cleft palate and an undeveloped chin (micrognathia) (fig 3) With insufficient room for the tongue to lie on the floor of the mouth and because of the cleft in the palate there was a tendency for the tongue to drop posteriorly backward into the cleft of the palate creating difficulty in breathing and in feeding the infant.



Figure 3 A premature infant with a cleft palate and undeveloped chin.

The baby was placed in an incubator with a constant flow of oxygen When removed from the incubator the child had the appearance of acute anoxia The condition was relieved when the tongue was pulled forward and out of the cleft by a ligature which was passed through its median raphe and secured to the face with adhesive strips When the tongue was in this position the infant had no difficulty in breathing and feeding was made easier

The ligature was removed after a week because it was cutting through the tongue The difficulty in breathing immediately re-

curred and signs of anoxia developed Two other attempts were made to ligate the tongue in different areas but the same difficulty was experienced and it became badly lacerated The infant continued to suffer from anoxia ever while it was in the incubator A final effort of ligation was made by placing a mattress suture through the tongue and securing it through the lower lip, fastened over rubber tubing Within 48 hours this suture also cut through the tongue

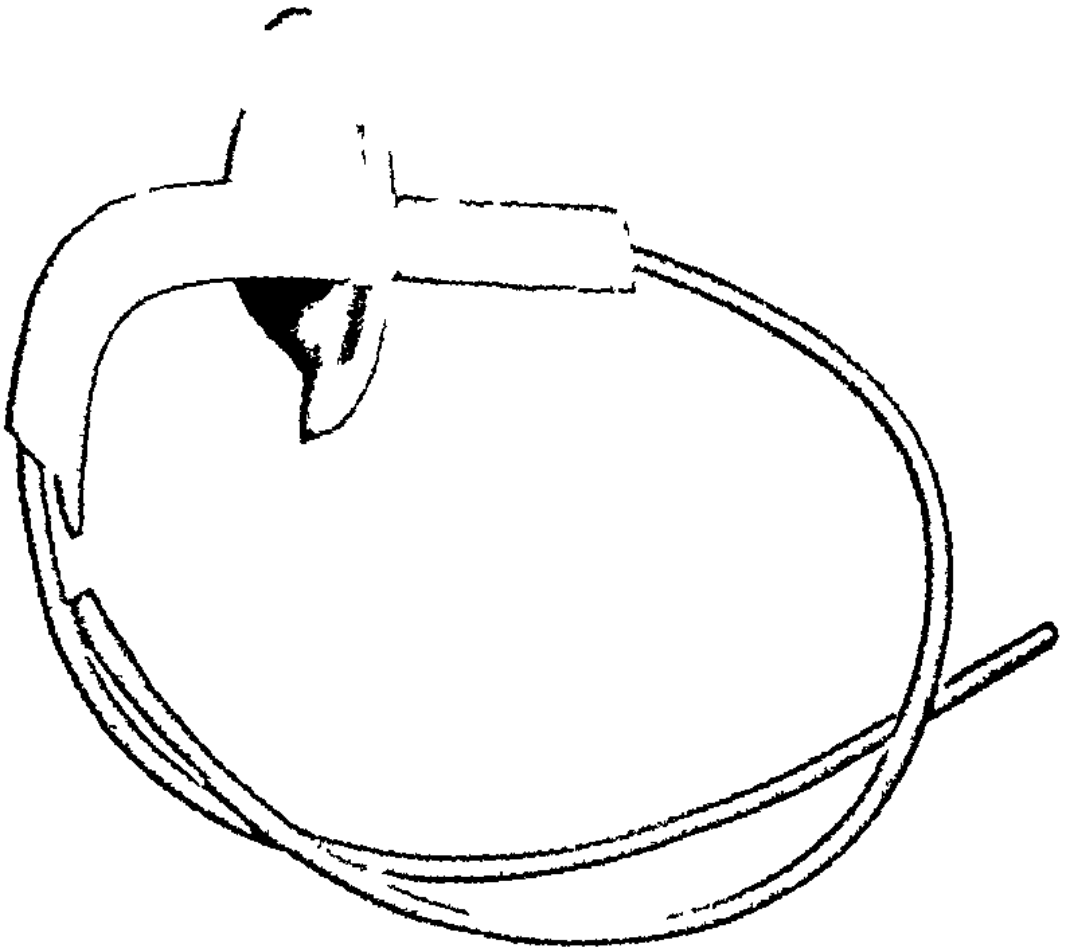


Figure 4 Airway appliance constructed of acrylic to hold tongue in position and permit feeding of infant

Because the child was losing weight an acrylic appliance which would hold the tongue forward and out of the cleft, and also provide a feeding tube through which a catheter could be inserted, was constructed A tubular airway was first made and fitted in such a manner that it would hold the tongue forward but not encroach upon the epiglottis A mouth shield was then fitted around the anterior portion of the airway so that it would not move downwards or laterally

A wax model was reconstructed and flasked much in the same manner as acrylic dentures are made The only difficulty en

countered was in securing a smooth and constant diameter of the lumen of the airway This was overcome by using cold-cure acrylic monomer[2] to make the open side of the airway after it was removed from the flask Thus, two thirds of the appliance was made with the usual cure-type acrylic and the remaining one-third which produced closure of the lumen was of the cold-cure type of acrylic monomer The appliance was highly polished and

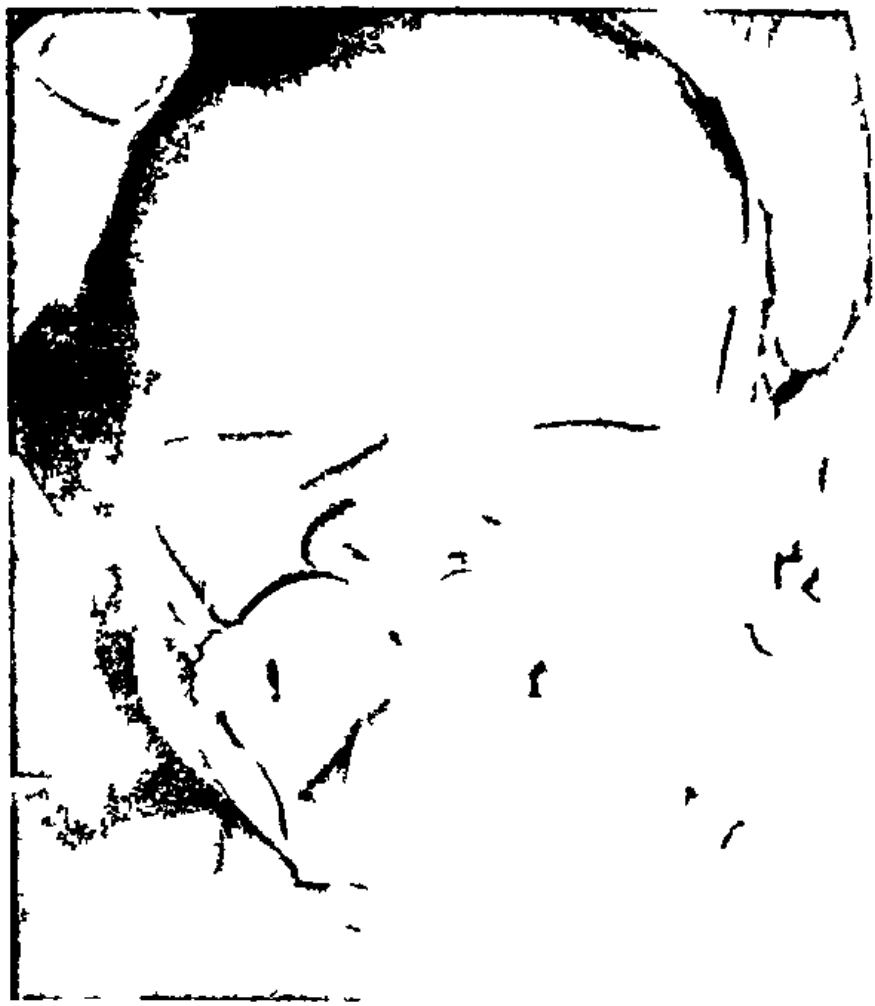


Figure 5 Airway appliance in place

its edges were rounded so that it would not irritate the mucous membranes of the infant s pharynx and oral cavity

This appliance was inserted and secured with adhesive strips to the infant s cheeks forehead, and chin The appliance was accepted immediately normal breathing was restored and the signs of anoxia disappeared A No 8 catheter was easily inserted through the hollow portion of the airway for feeding and the infant gained weight rapidly

Some irritation and edema of the pharynx and oral cavity were noted but soon disappeared The infant progressed well and a

second, more efficient appliance was constructed (fig 4) The ventral portion of the appliance again was constructed along the lines of the airway, but flatter Its width was increased so that the child could not displace the appliance laterally A tubular portion was added to the dorsal surface of the apparatus, which would admit a catheter varying in size from No 8 to No 10 The mouth shield was improved by inclusion of a notch for the chin and the lower portion of the nose Because of the skin irritation caused by adhesive tape, cloth tape was substituted and tied at the head (fig 5) With two interchangeable appliances, was facilitated

For two months the infant thrived and progressed until it was ed that the process of weaning from the appliance should be started Unfortunately, as in most infants with congenital anomalies, symptoms appeared indicating severe anomalies in parts of the body The infant contracted pneumonia and died

CONCLUSIONS

I believe that in rare instances such as this, the close co- of the dental and medical services can be of inesti - value Appliances of this nature can be quickly con ted by the dentist because of his technical knowledge and high degree of manipulative skill The dental services as a rule have a qualified oral and maxillofacial surgeon who is familiar with the detailed anatomy of the oral cavity and acquainted with the newer and better acrylic materials which are being produced The medical services also have men well trained in pediatrics, and the teamwork and co-operation of these officers are needed to obtain the desired results

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Bacterial allergy is believed to play a major role in the morbidity of tuberculosis the pathogenesis of rheumatic fever and in infectious asthma It is also thought to be an important factor in acute nephritis brucellosis rheumatoid arthritis "ld" reactions urticaria angio neurotic edema vasomotor rhinitis iritis uveitis focal infections and perhaps in pneumonia meningitis and numerous other conditions

—OSCAR SWINEFORD JR M D
in Virginia Medical Monthly

CASSETTE CHANGER FOR ANGIOGRAPHY AND ANGIOCARDIOGRAPHY

WILLIAM H WEHRMACHER *Lieutenant MC USNR*

GEORGE F STOCKER *Commander MC, USN*

CONFIRMATION of the clinical diagnosis of cardiac and peripheral circulatory disease is often desired when elaborate equipment is not available for this purpose The simple inexpensive easily constructed cassette changer herein described makes angiography and angiocardiography available for the military hospital only occasionally requiring these procedures It is not meant to substitute for more elaborate apparatus available in medical centers and research institutes but is convenient where limited frequency of use does not justify the larger investment.

The Apparatus

The changer consists essentially of a tunnel running beneath the patient and through which film-bearing cassettes are propelled It will carry four cassettes one registering beneath the patient and three in readiness to the side We find it convenient to use five cassettes a final one being loaded by the technician at the discharge shute after he has caught the previously exposed cassettes

Hospital carpenters constructed our apparatus from material available for regular hospital repairs As figures 1 and 2 show a wooden platform of heavy beams (1) braced with cross bars (2) lies at right angles across the x ray table Although the wooden platform extends considerably to the side of the table no special supports are necessary The weight of the superstructure and of the patient lying across it gives it adequate stability The undersurface of the platform is notched in a width equal to that of the x ray table to fix it in position across the table The upper surface of the wooden platform is grooved to receive a sliding metal framework (3) which holds four 14 by 17 inch cassettes

From the U S Naval Hospital Oceanside Calif Lieutenant Wehrmacher is now Northwestern University Medical School Chicago Ill

Numerals refer to indicated parts of figure 1

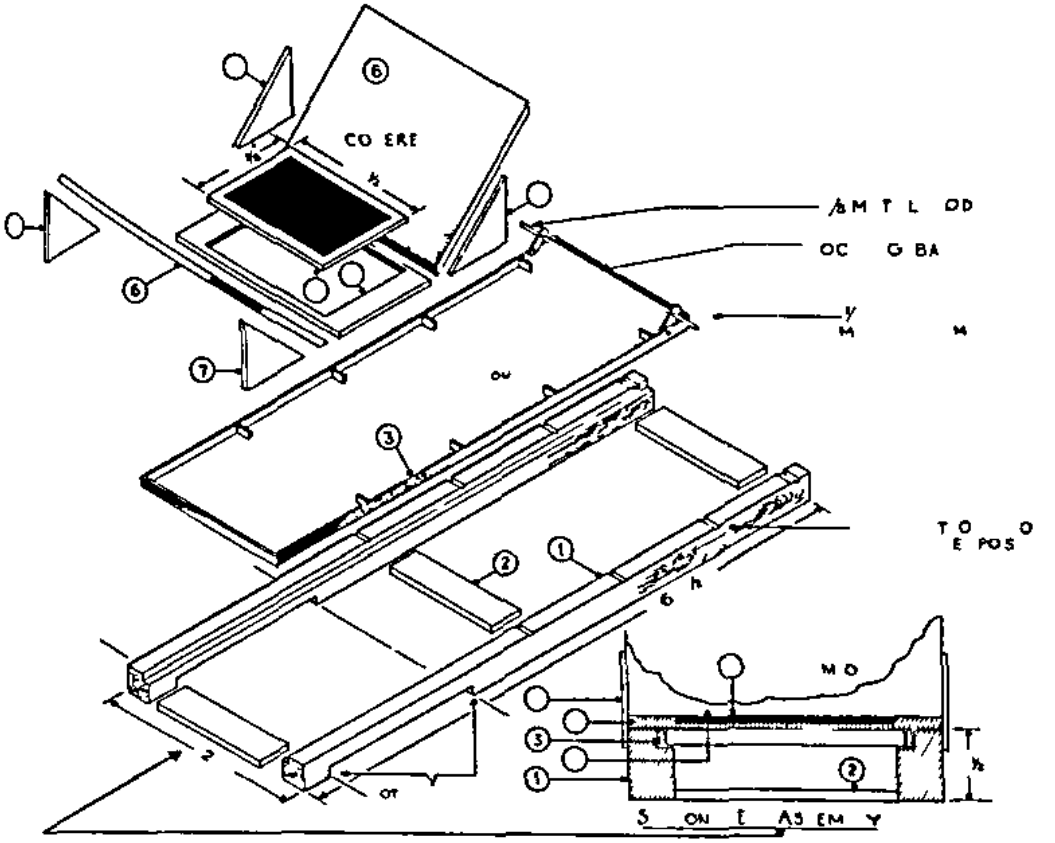


Figure 1 Diagram of the rapid cassette changer from above

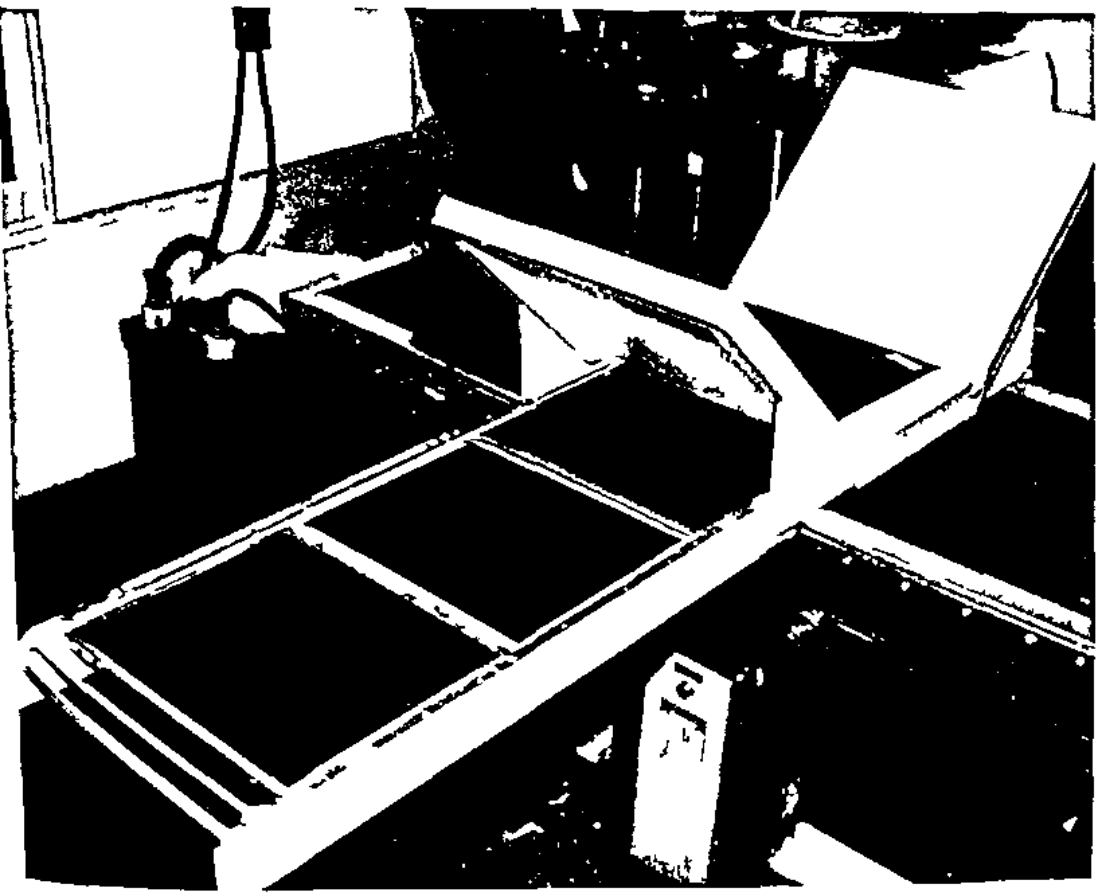


Figure 2 Photograph of changer from below

FRAMES FOR SPECTACLES IN ARCTIC CLIMATE

ERNEST M FULFORD *C pt n, MSC USAR*

ISSUE spectacles with metal or zylonite frames were tes by volunteers under actual and simulated field conditi Tests were conducted in Alaska at Point Barrow L Air Force Base, near Fairbanks, Big Delta Arctic Trair Center, and at Anchorage and Palmer No attempt was mad test the frames under controlled laboratory conditions

The tests and experiments were conducted because of numer requests from commanders for spectacles with zylonite fra for their troops because the men feared metal frames w freeze to their faces Having worn metal framed and rimless sp tacles at temperatures of minus 72 F in the Yukon Territor Canada without untoward effects I believed that these f were groundless but that further investigation seemed indica

This study was initiated at Fort Richardson Alaska, o overnight problem that included the construction of a lea which was to be occupied for the night without a fire The struction of a lean to involved a moderate amount of phys exertion for two men for one hour One member of each two team wore a pair of issue metal framed spectacles with p lenses or his own prescription The other wore the standard i zylonite frame with either plano or prescription lenses temperature was minus 21 F with little or no humidity D the exercise no evidence of adherence to the skin of the fac the ears by either type of frame was noted

After the team members retired in sleeping bags for the n the spectacles were hung over a convenient limb in the le and exposed to a falling temperature for six hours On arisir the morning with the temperature at minus 29 F each with his bare hand picked up the spectacles and immedi put them on No adherence to the skin of the hand or face curred When tests were conducted with moist or wet hands t was slight temporary adherence of the frames to skin bu laceration or tearing of skin occurred

The bridge of six new zylonite frames at a temperature of m 29 F withstood a mean bend from the normal plane of 78

F m Al ka G ne I D po Cap Fulf d w For Sam ll us on T s
1642

fore snapping, while the bridge of six zylonite frames two or more years old permitted a mean bend of 50 33 Table 1 shows that the old frame No 6 throws the mean figure off from what it would probably be if the experiment were carried further Elimination of the figure of 81 for No 6 would give a mean of 46

TABLE 1 *Flexion tests at minus 29° F*

Degree of bend from normal plane	
New frames	Old frames
80	42
9?	50
70	40
74	38
82	51
70	81
Mean bend 78	50 33°

The next phase of the test was conducted at Point Barrow the northernmost point in Alaska Conditions were ideal at the air strip for the test The temperature was minus 68 F and the wind was moving at 8 knots an hour Ten persons participated in the test five wore the standard metal frame and five the standard zylonite frame All spectacles had plano lenses and new frames, and were given enough pantoscopic tilt to bring the lower portion of the eyeframe into light contact with the cheeks of each person Flaps of the cap were worn down and tied beneath the chin

Even with a light breeze, it was difficult for any person to walk directly into the wind for more than a few feet without shielding the face with the hands After walking 500 feet the noses and cheeks of three men showed the white patches of frostbite, but not at points of frame contact with the skin They were returned to the plane Two of these were wearing zylonite frames

At the 900-foot point the cheeks chins, and noses of the remaining men showed evidence of frostbite but again there was no frostbite of the skin where the lower part of the eyeframe touched the cheeks

The next day, a site was selected on the Arctic Ocean, approximately nine miles from the airstrip where a 32 knot wind blew down from the north Ten new volunteers were selected five wore zylonite and five wore metal framed spectacle The temperature was minus 62 F , with little or no humidity Panto

scopic tilt brought the lower edge of the eyeframe into li contact with the upper portion of the cheek as before

The group faced the strong wind and began walking Prof tearing began almost immediately and because the men had b cautioned not to wipe the eyes so that the contact point wo not be disturbed tears ran down to the contact point and fr immediately Because this would not be a normal situation it v corrected and the men were told to keep tears wiped aw

The men could not face the wind for more than a few seco at a time Evidence of frostbite of the nose occurred in volunteers by the time they reached the 80-foot point At the 1 foot mark the cheeks and chins as well as the skin at contact points of all the men were frostbitten This po of the test was concluded at this point because it was not typ of normal work or combat conditions in the arctic because a f mask would ordinarily be worn A group of about 20 Eskimos had been watching the tests with great interest and bewilderm asked to test the spectacles Ten were selected and wea the spectacles, they trotted out to a point about 1 000 away and returned Our observers were surprised to find visible sign of frostbite at any point on their faces inclu the contact points of each type of eyeframe

TABLE 2 *Fl x t t at m 68 F*

D g of b d f m n m l pl	
Zylon t f me	A t l f m
26	96
32	102
28	110
30	91
10	72
17	68
A b d 23 83	58 16

Breakage tests were conducted at minus 68 F Each t frame was repeatedly dropped six feet onto a steel tread wi shattering apparent however one zylonite frame did fra along the top of the left eyeframe A six inch drop of a pound weight on the frames caused longitudinal and radi fractures in 10 out of 12 zylonite frames but only bendi nose pads on metal frames A 12 inch drop of the same w on the frames shattered 12 new zylonite frames like glas

solution made by dissolving a few old or broken zylonite frames in acetone (The solution is also an excellent repair substance for zylonite frames No particular proportions of zylonite and acetone are necessary as long as the mixture is liquid enough to coat the metal when dipped therein) This when hard prevented corroding of the metal from perspiration, and gave the individual assurance at least psychologically that the metal would not freeze or stick to his skin

SUMMARY

Tests in temperatures ranging from minus 21 F to minus 68 F indicate that danger of adherence of metal or zylonite frames to skin in subzero temperatures is negligible When the skin is moistened sufficiently to cause adherence the contact surface is so small that no laceration occurs

Conductivity of both types of frames is so low that freezing at contact points occurs only when cold and wind factors are so great that surrounding areas of skin freeze No evidence that the wearing of either type of frame is a contributing cause of frostbite exists, nor has any case of laceration of the skin by adherence of temple pieces thereto been reported

Bending and breaking tests reveal that the tensile strength and fracture resistance of the zylonite frames are lowered when the temperature drops below minus 20 F The frame will resist abuse at any temperature several times that to which it will normally be subjected

Metal frames are relatively unaffected by extreme cold Either type of frame is suitable for wear and use under arctic conditions but the metal frame is the more suitable

---

Nothing can replace the function of the human hand Even partial preservation of forearm and hand tissue is usually preferable in appearance and usefulness to th most highly developed and specialized prosthetic appliance It is a cardinal principle of traumat c surgery that extreme conservatism must be practiced in the management of hand and forearm wounds in order to retain as much viable t ssue as possible for future rehabilitation The temptation to perform early amp tation must be resisted even in view of extensive tissue destruction Débridement should include only obviously necrotic material and should be followed with early wound closure or skin coverage

—ERNEST A BRAV Colonel MC USA and
JOHN D BLAIR Colonel MC USA
in the *American Journal of Surgery*

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES OF THE ARMED FORCES

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BOOK REVIEWS

Criteria for Retirement A Report of a National Conference on Retirement of Older Workers edited by *Geneva Mathiasen*. 233 pages G P Putnam's Sons New York N Y 1953 Price $3 50

By prolonging life medical science has created a new social problem of an aging population This conference represents one phase of the earnest effort being expended in the search for a solution that will enable older people to live in dignity and comfort Those in attendance believed that there is much to be learned by industry from the Armed Forces use of the physical evaluation board for retirement of personnel One of the conclusions, though not a unanimous one, was that chronologic age as a sole basis for retirement should now be abandoned by both business and Government Objective criteria (other than job performance experience) which can be used as a basis for either retirement or change to another job do not at present exist. It was agreed that retirement based on chronologic age is both socially unwise and economically unsound This volume should be available to all Armed Forces personnel who occupy policy making positions

—Col R E Blount MC USA

Battle Casualties Incidence Mortality and Logistic Considerations by *Gilbert W Beebe* Ph D and *Michael E DeBakey* M D 277 pages illustrated Charles C Thomas Publisher Springfield Ill 1952 Price $10 50

This book is a thorough and comprehensive treatise on battle casualties based upon the authors' studies and statistical analysis of very extensive military records on this subject from World War II and in part from World War I and a few of historical interest from the Spanish American and U S Civil War It is of particular interest and of value to those concerned with large-scale medical planning for combat operations, also to those who work in any medical echelon dealing with casualties

The book is divided into six sections Section one outlines the mission of the book and discusses the statistics from which it was compiled Section two deals with the relative incidence of battle and nonbattle casualties and the incidence of hits and wounds relative to many variable factors In section three death from wounding, and the mechanism of death in battle casualties

parently are drawn and supported by" other data Also there is a tendency to use hypotheses applicable to adult Rorschachs for the interpretation of very young children s productions The need for more validation of such interpretation is evident

The book is recommended as a reference for clinical psychologists active in child guidance clinics and serves to bring into focus the need for more controlled research on this topic

—*Lt Col F A Zehrer MSC USA*

Saf gu d g M th hood by *S l T D L* M D 3d d t 140 pag s ill trat d w th d w g by *Gl dy M H gh* J B L pp t C Ph l d l ph P publ h 1953

This clearly written well illustrated volume fulfills its purpose to provide the expectant mother with information on the physical aspects of pregnancy and labor and aids in providing sound psychologic preparation for the mother This new edition is generally similar to the previous editions and contains much common sense advice It emphasizes the importance of confidence in medical supervision and is intended as a sound and comforting supplement to the physician s advice The material covered should help the expectant mother to co-operate more fully with her physician by aiding her understanding of normal and abnormal obstetrics The father to-be section is especially well written Uncommon and technical words and phrases used in the text are explained in a convenient glossary An index of the subjects discussed has also been provided for easy reference This book can be heartily recommended to prospective mothers and fathers

—*Col E A Zimmermann MC USA*

Gl oma P th logy a d Therapy by *P l W t* M D A ociat P of or f M d c l Oph halm l gy t th U er ty of Bud pe t Ch f f th Ey Departme t f th J w h H p tal t Budape t. T l t d by *J l F ld s* M D D pl mat f th Ame ca B d of P th l gy F ll w f Th Coll g of Am Path logists Dir ctor of Labora tor Hazl ton Stat Hosp tal nd St J ph Hosp l Ha leton P 295 page ll strat d Th C V M by Co St L M p bl h r 1953 P c $8

As a work on glaucoma that tries to gather a complete review of the subject into one small volume this monograph accomplishes its purpose and fills a decided need It contains a complete international bibliography of the literature on glaucoma published between 1930 and 1950 This bibliography fills 116 pages of small print

The volume contains chapters on the history, diagnosis clinical classification frequency and etiology of glaucoma An interesting aspect is the non American reflection given to the subject. This is well preserved in the translation The author outlines some of his own work and personal experiences He notes tha e

Ghetto in Budapest during World War II, a minority of glaucoma patients preserved their vision despite the absence of adequate medical help, and that these were the patients with spontaneous venous pulsation of the central vein of the retina This indicates the importance of low venous pressure in glaucoma simplex

Weinstein was a pupil of DeGrosz In an outline of the treatment of acute primary glaucoma he quotes DeGrosz as saying, "* * * but if the attack does not subside within a three-day period, with frequent pilocarpine installations, then the operation may not be delayed any longer " Few American ophthalmologists would agree with this statement Many would consider even 12 hours too great a delay

This monograph should appeal to the student for the bird s eye view it presents of glaucoma, and to the teacher for its excellent bibliography of the subject —*Comdr P J Giotta MC, USN*

Dermatologic Formulary f om th New Yo k Skin and Can er Unit Serv ce of Dermatology ed ted by *Frances Pascbe* M. D Revised 1953 150 pag Paul B Hoebe Inc New York N Y 1953 *Price* $3

The new edition of this excellent book contains the current dermatologic formulary of the skin and cancer unit of the New York University Hospital and represents the combined thought and experiences in dermatologic therapy of many leading dermatologists at that institution since 1882

The book is divided into three sections, viz, topical remedies, systemic therapy, and articles for clinic use There are 223 therapeutic items presented, all logically grouped as to type Each item is briefly discussed as to formula, action and uses, indications, and directions When applicable, contraindications, side effects, instructions to pharmacist, and additional information are also included The formulary is essentially complete and contains items reflecting the latest trends in dermatologic therapy, such as use of quinacrine hydrochloride (atabrine) in lupus erythematosis and ACTH and cortisone in dermatology

This book should prove of use to all members of the medical profession who deal in any manner with dermatologic patients It also would serve well as a model basic formulary for dermatologic inpatient and outpatient services —*Comdr V Hall MC USN*

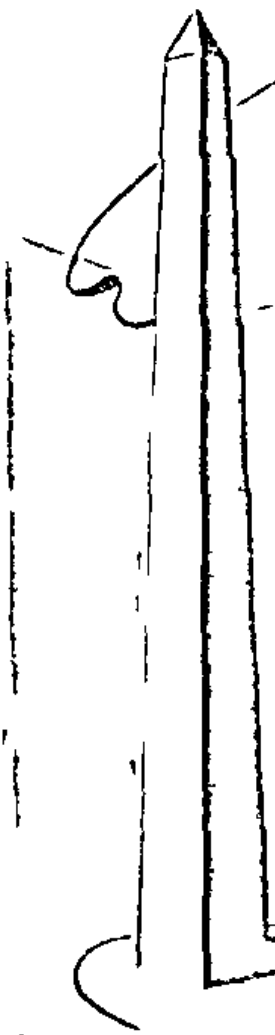
The Physician in Atomic Defense *Atomic Principles Biologic Re ction and* Organ zation *for* M dical Defen by *Thad P Sea s* M D 308 pages illustrated The Year Book Publ sh r Inc Chicago Ill 1953 Price $6

The author has chosen a difficult task in attempting to include in a text of this size a resume of the available material on atomic defense The volume is divided into three sections

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FOREWORD

Th *U t d St t Arm d Fo M d al J urnal* th med m for d
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S g Ge al U t d St t Navy

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MONTHLY MESSAGE

With the cessation of hostilities in Korea it is appropriate that the medical services of the Armed Forces take inventory of the results of their efforts to salvage those injured by enemy action or disease Statistical investigation reveals that never before in the history of warfare has a man wounded in combat found the odds so strongly in favor of his survival The health professions of the Armed Forces may well be proud of this accomplishment

Teamwork is a familiar slogan in the world of sports where the success of a particular competitive unit depends to a great degree on each player supporting the efforts of the team as a whole For each man who scores and receives the plaudits of the crowds there are many unsung heroes whose individual unspectacular efforts make possible the success of their team In a similar vein the artistic interpretation of an orchestral masterpiece is possible only through the cooperative efforts of musicians playing a variety of instruments with a wide multiplicity of tonal qualities blended into a single beautiful composition

Credit for the medical successes in the Korean episode goes to the entire Armed Forces health team composed of a wide variety of personnel with an equally wide range of responsibilities Certainly the contributions of the "medic" or aid man in the combat zone is a saga of heroism Following the injured patient through the chain of evacuation assisting the doctors are a host of personnel including the nurses the Medical Service Corps the hospital technicians and many other sustaining elements To this team our nation owes an undying debt of gratitude

Melvin A Casberg M D
Assistant Secretary of Defense
(Health and Medical)

A TRIBUTE TO THE ARMED FORCES INSTITUTE OF PATHOLOGY

MELVIN A CASBERG M D
Assistant Secretary of Defense

WE are here today to take part in laying the cornerstone of this new building, unique both in function and structure This is a milestone in the advance of medicine and I am grateful of the honor of speaking on such a significant occasion As we gather in the shadow of this modern edifice some may measure its greatness in terms of concrete tonnage or the dollar cost per square foot but I choose to measure it in terms which do not lend themselves readily to the computations of an adding machine—namely by the countless number of human lives saved and by the suffering and misery alleviated

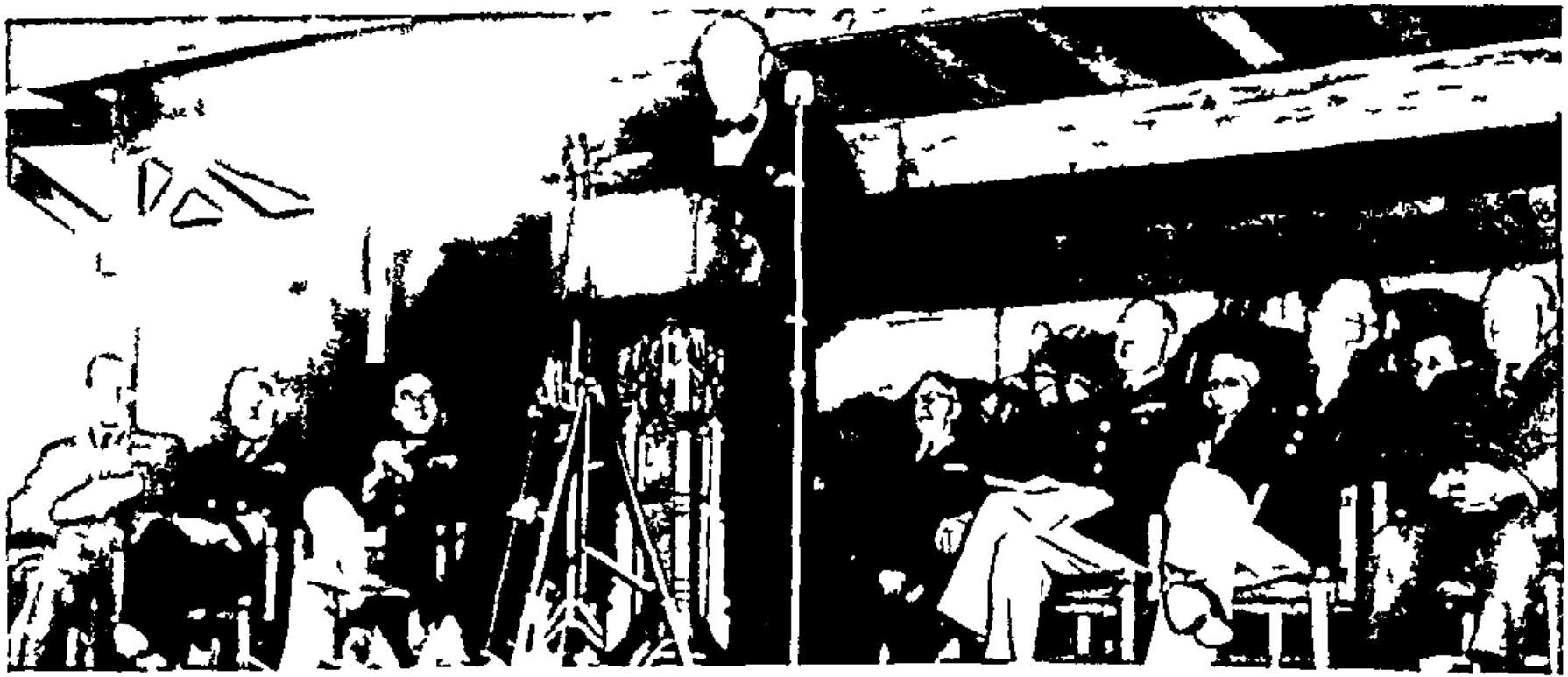
MUSEUM FOUNDED DURING CIVIL WAR

This great new Armed Forces Institute of Pathology is the culmination of the dreams of a host of distinguished men of American medicine The Armed Forces Institute of Pathology had its origin in the Army Medical Museum, which was founded during the Civil War by the imaginative and venturous Surgeon General, William A Hammond General Hammond envisioned a pathology laboratory, a medical school, and a permanent hospital, all joining in the task of training medical officers His dream will soon be fulfilled

John H Brinton the first Curator of the Museum, began the task of collecting battlefield specimens suitable for teaching purposes Working with him were Joseph J Woodward and George A Otis, and out of their efforts came the monumental work The Medical and Surgical History of the War of the Rebellion " As many of you know this was not only a historical document but also a teaching reference for years afterward The father of pathology, Rudolph Virchow had this to say in 1874 Whoever

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Address delivered at the ceremony for the cornerstone laying of the building of the Armed Forces Institute of Pathology Washington D C. 20 October 1953



D M l A C b g As t ta t S cret y f D f (Ill alth a d M d l) bown addre i g the nbl d g t bo ll nded the corne tone lay g c mony of the new b ld g f the A med Forc l t t t f P thol gy at W lter R d A my M d l C ter o 20 Oct ber 1953 S t d o the pl tform f om l ft to ight M jor G l Harry G A m t ong Surg on G ne l U S A For R Adm l L mo t P gh Surgeon G eral U S Navy M jor C neral G orge E A m t g Surg on C ne l U S A my D Che t S h f Sp c l A t t t the S cret ry f H lth Educatl nd W lfar (part lly hidd by t nd for mler pho) M Fred A M Namara, i charge of the ho p tal p gr m Bur a f the B dg t B ig di G ne l Elbe t D C wsey MC USA Dire tor of the l t t t of P thol gy M jor G ne l L onard D H t n, MC USA Command g G neral W lt R d A my M d l C t and B igadie G ne l Raymond O D t USA (R t) f t d tor f the if d l t t t At the ight i the d Vi Admw l Joel T Boone USN (R t) Ch f M d l Dire tor V ter Admi t t t on, nd D P lme W D arl g D P y Surg on G ne l U S P blic H lth Servi

takes in hand and examines these comprehensive publications will continually have his astonishment excited anew by the riches of the experience purchased at so great a price which is there recorded "

With me here on the platform this morning are four of the former curators and directors of this institution Gentlemen, we are indeed honored that you could be here with us today The removal of the Armed Forces Institute of Pathology from the old red brick building at 7th Street and Independence Avenue to this new setting must stir many vivid reflections in your minds That old building was a rambling, drafty structure with fireplaces surrounded by mohair armchairs in which one could sit and reflect The place has retained to this day that rare quality known as atmosphere, an attribute often associated with scientific pursuits That red brick building was designed by Colonel John Shaw Billings who was curator of the Museum and director of the Army Medical Library at the same time Because of his professional prestige influence, and foresight, Billings did much to obtain the close co-operation of these military establishments with the medical schools of our country and other scientific institutions It was in that same building on the Mall that Major Walter Reed completed his work on typhoid fever There, he and Major James Carroll formulated plans for the famous yellow fever studies

The Museum's role was recognized a few years before the turn of the century by the establishment within its walls of the Army Medical School In 1910 the school was moved, ultimately arriving on these grounds in a nearby building The re-establishment here in close proximity, of the school and this institute will soon be realized

In World War I there was a resurgence of activity at the Museum because of such men as Wilson, Herrick, Cattell, Lewis, Craig, and others Doctor James Ewing was one of the consultants at that time and great strides were made in developing the graphic principles of medical illustration

REGISTRIES OF PATHOLOGY ESTABLISHED

Brigadier General George R Callender initiated the more recent era of this institution when he became curator in 1920 His scientific contributions in the study of ballistics gas gangrene respiratory disease and other fields are well known to the profession Through his efforts the original registries of pathology were established for the mutual benefit of civilian and military pathologists in their study of disease His successor, Colonel James E Ash following these precepts, was able to expand the registries to more than a dozen during his tour as curator of

the Museum Colonel Ash continued to direct the institution throughout World War II the period of its most marked growth His wisdom and quiet example endeared him to the entire medical profession and the same qualities were reflected in the many scientific contributions of his staff during that conflict

For more than 20 years curators and friends of the Museum have striven for more adequate quarters This need for expansion had become critical by the end of the war for by that time as many as 5 000 specimens were arriving each month It was on such a scene that Brigadier General Raymond O Dart arrived as director The National Research Council which had offered advice and counsel during the war years was asked to determine the needs and suggest a solution for what appeared to the Army to be a vital part of medical progress This group of leaders of American medicine readily acknowledged the essential role of the Museum and the necessity for greatly improved facilities

RENAMED ARMY INSTITUTE OF PATHOLOGY

In recognition of its continuing contribution and future promise the Medical Museum was redesignated the Army Institute of Pathology The former name was retained for that portion of the institute continuing strict museum function A scientific advisory board of civilian authorities in the medical sciences was then formed With the support of this group and the National Research Council plans for the new building began to emerge Next, the Army Institute of Pathology was designated the central pathology laboratory for the rapidly expanding medical program of the Veterans Administration This enlarged its responsibilities immeasurably but was necessary in providing the best medical care to our youth who were serving or had served our country The Hawley Board and the Hoover Commission recognized the institution's special role and saw the importance and need for further expansion and autonomy As a result the Armed Forces Institute of Pathology was created as a unified structure within the Department of Defense It is now guided by a board of governors consisting of the Surgeons General of the Army Navy and Air Force with the advice and assistance of the scientific advisory board

DEDICATED TO SERVICE OF HUMANITY

It seems fitting to me that the first permanent structure to be erected by the unified Armed Forces was not an arsenal or a factory for tanks airplanes or battleships Instead we have this institute which is useful in peace as well as war and which is dedicated to the advancement of science in the service of humanity

This, then is the cornerstone of American medicine of today representing the united aims and efforts of civilian physicians as well as those in the Armed Forces This is the Armed Forces Institute of Pathology, devoted to the study of disease which is so ably directed by Brigadier General Elbert DeCoursey of the Army, with the assistance of Colonel Ralph N Thompson of the Air Force, Captain William M Silliphant of the Navy, and the advisory board of members of the civilian medical profession



D Casbe g shoun uith General Dart uses a t ouel made f om pa ts of an ea ly m croscope n the cornerstone laying of the Armed Forces Institute of Pathology The sealed m tal ec ptacle contains m crofilms of signifi cant h storical docume ts of the institute and tissue specimens from the Civil War and Wo ld War II

Now that we have traced its growth how can we summarize the activities and service of this institution? I have attempted to group them under only three headings, realizing that this may be oversimplification These are (1) consultation and diagnostic service (2) teaching and (3) investigation

CONSULTATION AND DIAGNOSTIC SERVICE

Let me illustrate how the consultation and diagnostic service has benefited our Armed Forces A young soldier in one of our Southern camps reported to the dispensary because of a growth

which had developed in his right eye A malignant tumor was suspected and immediate removal of the eye seemed necessary As a preliminary step however a fragment of the tumor was removed and after it had been examined by the local pathologist it was sent by airmail special delivery to the Armed Forces Institute of Pathology for an opinion as to diagnosis The reply was received by radiogram that this was a benign tumor The soldier still has both eyes

Consultation afforded to the individual pathologist is possible because of the relative abundance of material on hand regarding even the most exotic and rare conditions As Doctor Arnold Rich of Johns Hopkins University has remarked If a professor of pathology has one example of an unusual condition to study he can go to the Armed Forces Institute of Pathology and there study a hundred

In addition to individual consultation the members of this institution study and offer advice to our Surgeons General in many instances for example in the Southwest Pacific in World War II rumors became rife of possible permanent damage and even death being caused by atabrine the drug that was used for prevention of malaria A careful evaluation was made and the resulting conclusions were forwarded to the Surgeon General of the Army In turn the theater surgeon could reassure the soldiers sailors and marines on the fallacy of this rumor and emphasize the relative importance to the troops of protection against malaria

During the past world war this institution became a global clearing house for medical problems requiring studies in pathology The lines of its activity literally ran to the four corners of the world The inflow during 1944 amounted to an average daily reception of material from 15 autopsies and 60 surgical specimens Problems studied ranged in content and geographic distribution from coccidioidomycosis in our western states to schistosomiasis in North Africa from filariasis in the islands of the Pacific to scrub typhus in Burma At the present time 20 000 autopsy and 50 000 surgical specimens are received over a period of one year

TEACHING MATERIALS SHARED

The Armed Forces Institute of Pathology has been equally concerned with its responsibilities of teaching Graduate training in pathology is provided officers of the Armed Forces and civilian physicians Files on various aspects of pathology are supplied to medical schools and medical societies and study sets of microscopic slides are sent to any qualified physician who requests them Atlases of pathology have been prepared and are widely distributed Tissues from exotic diseases are shared

with teaching institutions the world over For example in the past few weeks sections of the brain from a rare case of salivary gland virus encephalitis were supplied to pathologists in this country and in England, Germany, and Austria Valuable specimens have also come in the reverse direction, enabling the Armed Forces Institute of Pathology to open a separate section of geographic pathology Thus, in this one central location, one may now study diseases peculiar to remote areas of the world The importance of such knowledge not only to our Armed Forces but also to any who may be called on to serve abroad is obvious

RESEARCH ACTIVITIES

The research activities of the Armed Forces Institute of Pathology have kept pace with its other endeavors The explosions at Hiroshima and Nagasaki opened an entirely new field of human and comparative pathology Much of this material has been studied at the Institute and is available there for continued investigation The same is true for epidemic hemorrhagic fever which caused such consternation when it broke out among American soldiers on the Korean battlefront three years ago Some of the basic problems in the design of body armor for our troops in Korea were given to the Institute to solve Many of the accomplishments in the field of research are due to the efforts of the band of consultants, who take time off from their university duties to share their knowledge with members of the staff

We are honored this morning by the presence of many distinguished representatives of our federal government and our civilian medical profession mute evidence of a basic interest in the health of our nation Some may have considered the Armed Forces Institute of Pathology as a repository of museum specimens and tissues dusty with age, specimens deposited to satisfy the morbid curiosity of the visiting populace Nothing could be further from the truth, for housed within the walls of this institution are the scientific keys which have and will continue to unlock the secrets of disease Here is demonstrated the close collaboration between Armed Forces and civilian medicine, a joint effort so smoothly woven that the identity of individual civilian and military threads are lost in the warp and woof of the composite product We recognize the necessity for continued union of investigative thought for only by such combined scientific endeavor can we conserve our freedom

ALLEVIATION OF SUFFERING

The custom of consecrating buildings and foundations is not a new one for history is replete with records of such functions As far back as the early Egyptian dynasties certain ancient temples built along the Nile contained engravings on stone designating the builder and describing the tools and material

of construction Many such ancient customs included sacrificial a pects both animal and human motivated by the fear of jealous spirits and gods Far removed from the element of fear and propitiation this function today is one of dedication a dedication to the alleviation of human suffering

As I spread the mortar which will unite the cornerstone with this building it shall be my prayer that all our medical resource civilian as well as military similarly shall be cemented in a united fight against disease and for the preservation of our country

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NAVAL DENTAL TRAINING FILM WINS AWARD

The Bureau of Medicine and Surgery has received notification that *the n val dental training film Periodontia entered in competition* with other films on parodontology at the thirteenth Congress of the International Association for the Research on Parodontopathies which was held in Gene a Switzerl nd in July won a Bronze Medal Award Th s is the third n val dental training film to win an international ward

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MILITARY OPHTHALMOLOGISTS ELECT NEW OFFICERS

Captain Fred Harbert MC USN U S Naval Hosp tal Philadelphia P w l cted presid nt of the Society of Military Ophthalmologists the a mual meeting at the Palmer House in Chicago on 13 October 1953 Other n w off cers chosen for the coming years were Colonel A n ld A Albright MC USA first ce president Colonel Richard S F ort USAF (MC) second vice president Colonel John H K ng Jr MC USA secretary treasurer and Brigadier General Earl Maxwell USAF (MC) nd Lieutenant Colonel Horace W Shreck MC USA members of the bo rd of governors

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The pr sent day method for evaluati g outcome of therapy in mental d sorder le e much to be desired The f rst diff culty comes from the fact that the d ta sually reported are not satisfact ry for evaluation The second essential d fficulty arises from the fact that a *given* therapy may not be s itable for o e patient but be suitable for another Prog no t c tests are needed for forecasting the type of ther py most suitable for a g en pat ent

—JOSEPH ZUBIN
in Journal of Nervous and Mental Disease

REHABILITATION OF MEDICAL EDUCATION IN SOUTH KOREA

BYRON L STEGER *Colonel MC USA*
FRANK D McCREARY *Lieutenant Colonel MC USA*
MARLO E SMITH *Major MSC USA*

A heart-warming rebirth of medical education in South Korea is in progress after a two-year period of stagnation In times of conflict such as that in Korea, education is one of the first casualties While the medical schools were forced to close, the war simultaneously intensified the need for professional medical and allied science personnel of all kinds To supply medical personnel for the Republic of Korea (ROK) armed forces, and equally important, to train personnel to meet the desperate needs for medical care and public health of the civilian populace, the schools have been reopened

Reports[1] indicate there were 2,200 physicians in the ROK military services by December 1952 Until recently, civilian physicians under the age of 38 years were called into military service by ROK draft laws for 30 days of training, this has now been increased to 60 days Less than 800 qualified physicians remained in private practice, and they were concentrated in and around the major cities Rural areas were not properly covered Five hundred and twenty nine dispensaries and 109 hospitals provided the bulk of the medical care throughout the country Over 90 percent of the recent medical school graduates were drafted into the military services

According to the ROK Ministry of Health,[2] the census of doctors in South Korea in January 1953 was as follows

ROKA (medical doctors and "qualified doctors)	2 200
Governm nt official and schools (and) ..	320
In public ho pitals dispensaries prison and VD clinics (and)	1 374
Private practice (and and limited doctors)..	1 213

F om Off c of Surgeo He dq rt r Kore n Communi ations Zo Col Steg r is ow at th Army W Colleg Carl sle Pa

Out of the country	130
Total	5 237

Medical doctor graduates from pre-war medical schools
Emergency or qualified doctors those who have studied only more than
two years or more medical schools They may practice general medicine
Licensed doctors graduates from pre-war medical schools usually practiced
self-educated educated abroad practicing general medicine
many on They are concentrated in the greater Seoul area
where a geographical imbalance exists with inadequate numbers

Herb Doctors

There are also about 5 000 herb doctors (herbalists) who practice an art of Chinese healing called "Han-oi There are no schools for these and the art of diagnosis and treatment has been passed down from teacher to assistant for 50 centuries This art is based on the fundamental principles of Yang (positive) and Um (negative) theory So long as the positive and negative factors are in balance the individual is well If they are out of balance he is sick

The Han oi doctor whose diagnosis is based on philosophic observations and analyses explains the cause of all ailments and determines the treatment therefor by this positive and negative theory plus palpation of the radial pulse of which the Han-oi claim there are 38 different varieties Each variety it is claimed is recognized and evaluated by the Han oi practitioner in the practice of his art. Both diagnosis and treatment are reported to be crude and unscientific and greatly influenced by superstition Nevertheless Han oi is still reported as being very popular with the general Korean public and more patients are treated by Han oi practitioners than by all other doctors combined This information is presented to illustrate the desperate need for proper medical education in Korea now and in the years to come

Prewar School System

Korea had an excellent school system before the war and the literacy rate was high at all economic levels The Japanese, who occupied the nation from 1910 to 1945 encouraged education and had built up an educational physical plant that ranked high in the Orient Besides several dental nursing veterinary and pharmacy schools there were six recognized medical schools in prewar South Korea

1 Seoul National University founded in 1924 by the Japanese and operated by the government. Reborn in August 1946 with nine colleges by Allied Military Government In September 1950 the tenth college (Seoul College of Pharmacy a private institution) was added by affiliation

2 Severance Union Medical School in Seoul, under missionary control Founded in 1893 by a Presbyterian missionary whose name it bears This institution first introduced western medicine to Korea

3 Seoul Women's Medical College, a private institution, is now operating temporarily in Pusan

4 Medical College of Ewha University in Seoul, operated by missionaries, is also temporarily located in Pusan

5 Taegu Medical College, founded in 1923 in Taegu by the Japanese and operated by the government

6 Kwangju Medical College in Kwangju, founded in 1943 by the Japanese, is operated by the government

The prewar enrollment of these schools was about 2,000 students, of which 370 were women The largest number (about 500) was enrolled in the School of Medicine of Seoul National University, which is reported to have been the most important school of the six [4] It was the only school which had been given university rank and its medical college was claimed to compare favorably with medical schools in other countries [5] This school and the Severance Union Medical School were well organized and equipped to provide good 4-year medical education Prior to 1947, Seoul National University Medical College was the only one that required two years of premedical training Since that time, all of the medical schools require two years of premedical college education

Two Major Upheavals

Even before the Korean conflict the operation of a medical school was difficult in Korea and was complicated by distressing chronic shortages of faculty members, equipment, and supplies such as texts, drugs, training aids, surgical supplies, and the like There have been two major upheavals in the medical education in Korea During the Japanese regime in Korea most of the important faculty posts were filled by Japanese and few Koreans were given the opportunity to become qualified for medical teaching For example, when Seoul National University (then known as Keijo Imperial University) was under Japanese control there were 200 members on the faculty of the medical school but not a single professorship was offered to a Korean [6] With the sudden withdrawal of Japanese in 1945, the shortage of qualified doctors to serve on the medical school faculties was great However, prominent Korean physicians took over and all the medical schools were functioning with active support from Allied Military Government by the time the second blow fell in June 1950

The Republic of Korea was just starting to meet the educational needs of its people newly introduced to independence and democracy when the communist invasion of June 1950 wrought physical and economic destruction and caused disorganization to the political and social life of the people More than one third of the total school buildings in South Korea were completely destroyed and another 15 percent were so badly damaged that the buildings were unsatisfactory for educational use About 27 percent of all public and school libraries and 81 percent of all school equipment and instructional materials including textbooks reference materials desks blackboards scientific equipment and teaching aids were completely destroyed While these figures represent the loss and damage to the educational physical plant as a whole the medical schools are included in them The rapidity with which the war closed the medical schools is shown in table 1

TABLE 1

School	D t f u p ad d p t
Se ul N t l M d l Coll g	28 J 1950
Se U M d l C ll g	28 J 1950
Kw gj M d l C ll g	10 J ly 1950
T gu M d al Coll g	20 July 1950

Medical Colleges Damaged and/or Destroyed

The physical plants of Severance Union Medical College and the Kwangju Medical College were subsequently badly damaged by the war and the plants of Seoul National University and the *Taegu Medical College were partly destroyed The disposition of* the physical plants during the first two years of the Korean conflict are shown as follows

1 The Seoul National University moved its staff and faculty to Pusan with the movement of the government and a considerable portion of the refugee population at the time of the retrogression into the Pusan perimeter in the fall of 1950 The main buildings of the school in Seoul were occupied by the Headquarters of Fifth Air Force and the hospital was taken over by a ROK Army Hospital The University resumed partial operations in December 1950 in temporary quarters in Pusan

2 Severance Union Medical College was badly damaged (it is located across the street from the Seoul Railway Station) but some of the buildings or portions of them were still used

as housing for refugees and for limited relief medical care When the college resumed limited teaching operations in December 1950, it was in a greatly reduced physical plant and under extremely crude and limited conditions

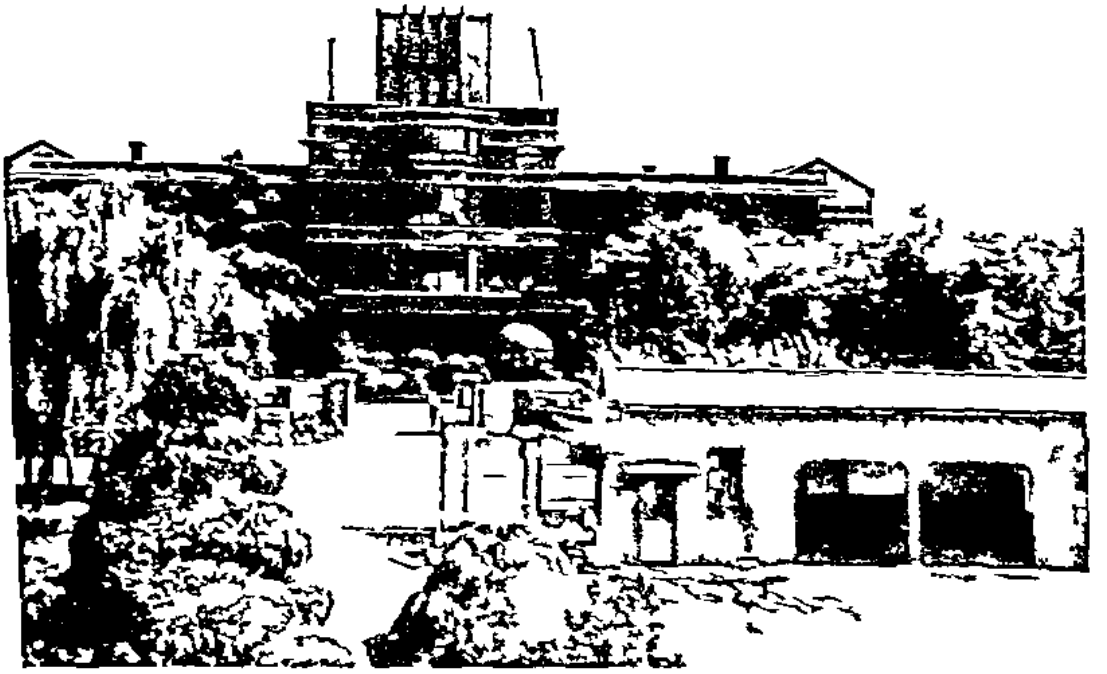


Figure 1 Front view of the main building Taegu Medical College Taegu Korea.

3 Kwangju Medical College suspended all teaching in July 1950 and continued with a small patient load in the hospital's intact buildings, or portions of them, after the North Koreans were driven back north in the fall of 1950 The medical college resumed operations with a very limited enrollment and staff in the same buildings in December 1950

4 Taegu Medical College was founded with a teaching hospital of 17 departments [4] It grew and expanded into new buildings (figs 1 and 2) in September 1932 In August 1945, Dr P K Koh, the first Korean dean, reorganized the college with an all Korean faculty and students In July 1950 the college was forced to cease operations, its buildings were occupied by U N military forces and later by the headquarters of Korean Military Advisory Group (KMAG) while the teaching hospital was occupied by the 1st ROK Army Hospital unit. More than 80 percent of the faculty and 85 percent of the student body were drafted into the ROK Army In December 1950 the Ministry of Education and Defense ordered the college to reopen on the maximum basis possible Accordingly, teaching was resumed by 17 faculty members with

30 students Classes were held in the homes of the faculty members Practically no textbooks equipment or supplies were available



F g re 2 F t iew f the tea h g ho p tal Ta g M dical Coll g Taeg Ko

In March 1951 through the assistance of United Nations Civil Assistance Command Korea (UNCACK) several quonset huts and a small stock of textbooks and medical supplies were given to the college One year later two buildings of the teaching hospital were released to the college by the 1st ROK Army Hospital unit This permitted the teaching hospital and the basic science departments to resume operations on a limited scale

For the fall term beginning on 14 October 1952 the college obtained possession of a few temporary frame buildings several blocks distant from the teaching hospital This annex consisting of three bare unheated poorly lighted uncomfortable crudely equipped classrooms (fig 3) and a small administrative office served the first second and third year classes

The fourth year students classes were conducted in a small portion of the teaching hospital

A brief tabulation of the enrollment and other statistics on Taegu Medical College are shown in table 2

Since its existence the Taegu Medical College has graduated a total of 1 035 students including Japanese Korean, and Chinese



Figure 3 A class of second year students in the annex of the Taegu Medical College November 1952 Note crude furniture empty light socket and worn blackboa d

Physicians, Medical Training, and Supplies Needed

In the fall of 1952 the college began receiving monthly ship ments of medical supplies from the Civil Relief in Korea (CRIK) for use in the teaching hospital, and the physical plant facilities were augmented by a gift of 40 beds and a shipment of blankets from UNCACK

In 1952 Taegu Medical College became affiliated with the Kyong Puk University in Taegu, of which Dr P K Koh had become president and his duties as Dean of the Medical College were assumed by Dr Chong Ho Pae

The efforts of the medical colleges in Korea to operate, even in a reduced condition under monumental handicaps and shortages of adequate and proper equipment and supplies, were very com mendable and revealed a spirit in the Korean medical profession that deserved the support and encouragement of everyone

As fighting progressed and more ROKA divisions were activated and required medical officers and nurses, the drain (by draft) on the civilian practitioners became heavier While private prac titioners were being drafted from civilian life the health of the civilian populace became endangered This was particula

TABLE 2

Y	T tal nr llm t	T tal N f gr d t lly	S e f f ulty (K e)	N mbe f f mal tud	Numbe f f mal gr duat	N mb djun t U N f ulty
1945	330	20	58			
1946	164	21	72	4		
1947	194	32	78	11		
1948	216	53	75	17		
1949	224	72	86	17	4	
1950	50	19	17	11	8	
1951	104	17	17	6	1	
1952	131	36	19	5	2	22
1953	202	30	28	7		41
1954	270	18		8	1	
1955	364	44		11	1	

A t p d

true in the large cities where thousands of refugees were assembled All of these factors forced the issue that the graduates of medical schools were badly needed and medical education in Korea had to be rejuvenated on a large and efficient basis

The need was apparent to many persons but it became a particular interest of Major General William E Shambora, the Chief Surgeon of the Far East Command, who, in turn, communicated his enthusiasm for the project to Brigadier General Louis Holmes Ginn, Surgeon of the Eighth Army and Colonel Byron L Steger, Surgeon of the Korean Communications Zone The FECOM Chief Surgeon expressed his interest in several concrete ways First, he pointed out the desirability of U N medical officers and other allied scientists actually participating in the teaching of the medical schools on a part-time basis This was a very desirable project because heretofore Koreans had learned primarily German and Japanese medicine and had never been exposed to American medical practice and teaching From observation of the excellent results achieved in Korea by American medicine and, with their natural eagerness to learn, the Korean medical faculties and students readily accepted the suggestion of instruction from U N teachers Second, the FECOM Chief Surgeon and others sent urgent appeals to various agencies in the United States requesting that teaching aids of all kinds be sent to Korea for the use of medical students Textbooks and journals were promptly sent by many generous agencies and individuals and the material began to flow into Korea in the fall of 1952 (fig 4)

U N Officers Participate in Teaching Programs

In the meantime, U N medical officers and allied scientists in Korea, stimulated by the interest of the surgeons of the major commands, in October 1952 began actively participating in the teaching programs at three medical schools The staff of Severance Union Medical College in Seoul was supplemented by officers from the Eighth Army, primarily from the Office of the Surgeon Assistance to Seoul National University Medical College and Ewha Women s Medical College, both located in Pusan in temporary quarters, was given by an adjunct faculty drawn largely from the officers serving in the Korean Base Section headquarters and the 21st Station Hospital in Pusan The faculty of Taegu Medical College was augmented by medical service officers serving in the Taegu area in the medical sections of Hq KComZ Hq Fifth Air Force (Rear), the 25th Station Hospital, and the Provincial Team of UNCACK and one officer from the Office of the Surgeon of KBS The Surgeon, KComZ, served as adjunct Dean of the College and organized the U N Staff



F gur 4 One of the f t hipm nt f book ved by T g M d al C ll g f om d or in th U t d St t

An illustration of the type of instruction offered by the ad junct faculties of these colleges is given by the schedule of the Taegu Medical College from 14 October 1952 through 24 March 1953 in table 3

Because the Korean faculty varied from college to college the adjunct military faculties were called on to teach different courses at the various colleges (tables 4 and 5)

The Korean scholastic year is organized differently from that in the United States The school day is divided into four teaching periods of 90 minutes each (last year, 105 minutes) as follows first period 0830 hours to 1000 hours second period 1010 hours to 1140 hours third period 1300 hours to 1430 hours fourth period 1440 hours to 1610 hours The first semester was programed on the following schedule 13 April 1953 classes begin 15 to 20 June 1953 examinations 18 July to 1 September 1953 summer vacation 21 to 26 September 1953 final examinations The second semester will begin on or about 15 October 1953 and will end on or about 15 March 1954

The various medical disciplines were organized under volunteer medical or allied science personnel of the U N Armed Forces

who were designated monitors of their respective disciplines The general headings presented in Taegu Medical College were as follows general and orthopedic surgery, obstetrics and gynecology urology, eye, ear, nose and throat, endocrinology, medicine, pediatrics, allergy, dermatology, bacteriology, public health, physiology, pharmacology, gross anatomy and biochemistry

TABLE 3 *Type of instruction offered by Taegu Medical College*

Subject	No of 105-minute periods
Second year class	
Parasitology	20
Public health	22
Bacteriology	22
Antibiotics and bacteriostatic agents	7
Dermatology	5
Radiology	6
Third year class	
Pediatrics	22
Orthopedic surgery	18
Fourth year class	
Internal medicine	20
Genitourinary surgery	*18*

Problems a Challenge to Instructors

From the very beginning, participation in regular teaching in Korean medical schools was a rich experience for the U N adjunct faculties The many problems which continually arose presented a real challenge to the instructors Some of these problems were minor and easily solved, others were never satisfactorily solved during the first term

First, none of the classrooms were heated and this was a new experience to the faculty but not to the students The students came to class warmly dressed and only on the coldest days did they show evidence of discomfort or inconvenience in taking notes or sitting still for long periods of instruction The instructors soon learned to come to class warmly dressed

In addition to lack of heat, the classrooms were poorly lighted (electricity was a scarce and unreliable commodity in Korea) and the furniture and fixtures were crude and uncomfortable In most cases the students sat on benches in pairs at crude desks and the instructor used a worn wooden blackboard temporarily mounted on a makeshift easel (fig 3)

TABLE 4 S lN t lU ty M d lS h l P

S bj t	N mb f p d
F t y l	
Phy l gy — — —	2
S d y l	
H m l gy —	3
Th d y l	
P bl h lth — — — — —	11
A h l gy h t s g y — — —	3
F h y l	
A h l gy h t g ry — — —	3
Orth p d d b g ry — — — —	11
P bl h lth — — — — — —	11
D f h g t ur y y t m — —	5
Ob t tr l th — —	2
C d l gy p y h m m d h m t fe p y h t on m d — —	11

Language proved to be less of a handicap than anticipated Korean students are taught English in the lower grades and acquire a fair reading knowledge of it as children They read English with far less difficulty than they either hear or speak it In addition to English learned in school, many of them had opportunities to learn English by associating in some capacity with American missionaries the occupation troops Allied Military Government or KMAG during the years 1945 1949 and after the outbreak of the war in June 1950 A certain few students in every class spoke excellent English and could easily interpret for the others who may have had only a reading knowledge of the language and were slow at it The U N instructors soon learned that if they spoke very slowly and continued to speak slowly (without speeding up) most of the students would grasp the material with minimum difficulty Frequent pauses in the instruction gave students with excellent perception a chance to translate the instructor s remarks into Korean for the benefit of the others The reverse process was also employed At first the Korean students were reluctant to ask questions Whether this was due to their natural timidity or to their uneasiness about expressing themselves in English was unknown Because of this the scheme of having the student interpreters in the class collect the questions from all the students and present them to the instructor was evolved This system worked with great success

TABLE 5 *Ewha Women s Medical School Pusan*

Subject	Number of periods
First year class (12 students)	
Biochemistry physiology	11
Fourth year class (13 students)	
Endocrinology cardiology metabolic diseases	11
General and orthopedic surgery	11
Public health	11
Eye ear nose and throat	11
Hematology pathology	11
Obst trics	5

U N instructors also learned quickly that it was necessary for them to enunciate distinctly and to scrupulously avoid slang or expressions which were often unfamiliar to the koreans They also learned that, because of the necessity for speaking slowly, the instruction proceeded at a slower pace than they had been accustomed to in their own medical schools It was not possible to cover nearly as much material per hour but it was decided that it was better to cover less material and insure that the students actually absorbed what was offered

It became clear very early that korean students were unac customed to facetiousness and wit from their instructors Educa tion, particularly medical, is serious business in korea and students usually make tremendous sacrifices to attend school Thus any time devoted to levity is not appreciated and attempts at jokes or wit generally fall flat with the students However, by the time the school year ended in March 1953, most of the students were beginning to adapt themselves to Americans at-ease methods

The lack of textbooks was a serious handicap to instruction This was partially solved in several ways

1 A few texts began to arrive and could be cited as references from time to time However, with the number of students who had to use one book in the library, this was not too workable

2 Some of the instructors wrote out their lectures verbatim and had them reproduced by *mimeograph* or *ditto* process These were handed to the students a few days prior to presentation which give them an opportunity to study them For obvious reasons this was not satisfactory although it did give the students the semblance of a textbook in the course It was very poor pedagogy

to read a lecture to the students and furthermore tended to leave the impression that the time of both the students and the instructor was being wasted in the process In addition, it took a vast amount of time to prepare lectures in this fashion and soon became a strain on Army reproduction facilities and typists

3 At the beginning of the new school year on 13 April 1953 this subject was discussed at a conference with the Dean of the Taegu Medical College Out of this discussion came a new policy which seemed to work admirably The plan was for each instructor to prepare a rather detailed outline of the material he proposed to discuss in any given period of instruction including sketches diagrams and references to the texts and journals which had by that time been received by the school library These outlines are then reproduced by the college through a Korean mimeographing process and distributed to the students a few days prior to the date of the delivery of the lecture These outlines are reproduced in English handwritten script with unusual and technical words in Korean characters in parentheses and with interline spaces adequate for students to fill in any notes they desire to add from the instructor s remarks on the date of presentation

In presenting the subject the instructor carefully followed the outline making explanatory remarks and supplementing it with material not covered in the outline In doing this it was found that students absorb more of the material if words which are more or less unfamiliar to the students are written on the black board Another little trick in this connection was for the instructor to pause frequently when he came to a word (he soon learns to sense the words) that was new to the students to write it on the blackboard and ask those with dictionaries to look up the word in their English Japanese or English Korean dictionaries to read its counterpart in Japanese (which they all understand), and to explain its meaning (in Japanese or Korean) to the others

The lack of training aids such as models charts graphs slides microscopes and many others proved to be a tremendous handicap to optimum presentation of material Most of these were left to the ingenuity and improvisation of the instructors Certain Army training films particularly the professional medical films were used because the Korean students can follow them very well and they are delighted with this type of instruction In addition, the use of a balopticon obtained from Army sources permitted the projection of illustrations and text material from textbooks and journals on a screen for all students to read and absorb

Field Trips and Ward Rounds New

Two American teaching technics, almost totally unfamiliar to Korean students, but thoroughly pleasing to them, were field trips to hospitals, water supply installations, garbage dumps, insect and rodent-control activities and ward rounds for teaching purposes These methods have been received by the Korean students with a great deal of enthusiasm which has been gratifying to their U N instructors

Rehabilitation Plans

With the advent of the new and current school year on 13 April 1953, extensive plans were made to augment the Korean faculty of Taegu Medical College with more adjunct professors from U N sources than had participated in the previous semester This was necessary due to the additional demand and drain on the Korean faculty members by the Korean Armed Forces, the galloping inflation which forced many older faculty members more and more into private practice to make a satisfactory income, and the enlarged enrollment of students

Another major boost to the Taegu Medical College was provided by a three way shift of military activities in the Taegu area First, the 25th Station Hospital moved in December 1952 to new buildings that had been specially built for it This released the buildings and grounds of its former site for occupation by KMAG Headquarters and the 1st ROKA Hospital When Hq of KMAG vacated the main classroom and administration building of the Medical College (fig 1) in January 1953, the college prepared to give up its temporary annex and other makeshift housing and reoccupy its main building at the beginning of the new term on 13 April 1953 In March 1953, the 1st ROKA Hospital vacated the major portion of the teaching hospital (fig 2) which it had occupied for two years and work was started on rehabilitating it for its original purpose

Perhaps the largest and most important development to date in the rehabilitation of medical education in Korea was the decision by the United Nations Korean Reconstruction Agency (UNKRA), which had been created by the United Nations to take over all functions of relief and rehabilitation of the nation, to allot a large sum of money from its FY 1953 budget to begin the reconstruction and re-equipment of the college into a modern, well equipped, medical center

Accordingly a draft project was prepared as a joint UNKRA/UNCACK project for the rehabilitation of the physical and technical facilities of the Taegu Medical College [2] The decision to do this was predicated on the self evident fact that the socio-

the required assessment could be made Where practical assistance was given the patient in making adjustment to the problems discovered

SOCIAL ADJUSTMENT

The first factor considered was his social adjustment prior to illness Five areas of adjustment were considered and were rated as either satisfactory or unsatisfactory The patient s social adjustment was rated as satisfactory unless disturbances were present in three or more of the following areas

Family Deprivation of parental care at an early age extreme poverty presence of strong negative attitudes toward home parents or parent substitutes and siblings

School Inability to finish high school unless due to financial or family pressures many failures in school difficulties in getting along with teachers or schoolmates expressed negative attitude toward school

Occupation Inability to select an occupation in keeping with his capacities failure to retain jobs frequent job changes without realistic reasons reliance on unemployment compensation in ability to get along with superiors

Social Inability to get along with people unstable marriage marked by conflict separation or divorce inability to accept family responsibility or parenthood

Military Inability to get along with superiors failure to achieve and hold grade two or more courts martial

STRESS

A second factor considered was the presence of stress situations at the time of onset of symptoms leading to his hospitalization An effort was made to distinguish between stresses peculiar to personal life and those due to military life Personal life stresses included such problems as illness or death in the family increased family responsibility intense marital conflict financial responsibilities exceeding income Military stresses included new experiences which the patient was unable to handle because of personality characteristics For example increased grade and responsibilities in a patient who was a predominantly passive individual and became disturbed in positions of authority and responsibility Combat duty and repeated overseas assignments were also included as stress factors

MOTIVATION

A third factor taken into consideration was past and current motivation for military service as indicated by the patient s

attitudes Motivation was rated as unsatisfactory if the patient was markedly dissatisfied with his current duty assignment, or if he had strongly opposed coming into the service and had attempted to avoid induction, or if he was experiencing intense feelings of frustration or discrimination

PERSONALITY

A limited attempt was made to evaluate the patient s personality characteristics Predominant and easily recognized traits were noted and were used mainly for an additional evaluation of the adjustment and stress factors These traits were impulsiveness, fear of responsibility, feelings of discrimination, passivity, dependency, tendency to withdraw under stress, conflict with authority, goal directed drive, marked striving for success, perfectionism, ability to assume responsibility, and fear of failure

The chi square (x^2) of Edwards[6] was employed in the analysis of the data collected The correction factor suggested by Edwards has been applied in most of the x^2 tests which contain a cell entry of less than five

DATA COLLECTED

The 40 patients who met the criteria outlined earlier were 36 white and four Negro enlisted men Their ages varied from 20 to 54 years, the median being 26 Length of service prior to first hospitalization ranged from one day to 22 years The median length of service prior to first hospitalization was two years Twenty five patients were regular army, 13 were draftees one was a reservist recalled to active duty, and one was a National Guardsman whose unit was activated Twenty-one patients were in the grade of corporal or below and 19 were above, 16 of whom had served more than two years

Seven patients had ulcer symptoms before entering the service, but only three of these believed that military duty aggravated their symptoms Twenty six of the patients were returned to duty after medical treatment, and six of seven returned to duty after an operation One patient was given a disability discharge, partially because of an anxiety state two were separated from the service for the convenience of the government, and five who had previously failed to make a satisfactory adjustment were transferred to the neuropsychiatric service for disposition

The total adjustment was satisfactory in 22 and unsatisfactory in 18 patients Figure 1 gives a comparison of the number of patients having previously satisfactory adjustments with those having previously unsatisfactory adjustments, according to length of service The selection of the four groups was arrived at by arranging the length of service prior to first hospitalization in con

secutive order and dividing by four The divisions did not include any overlapping periods The same four groups are used through out the study in groupings according to length of service

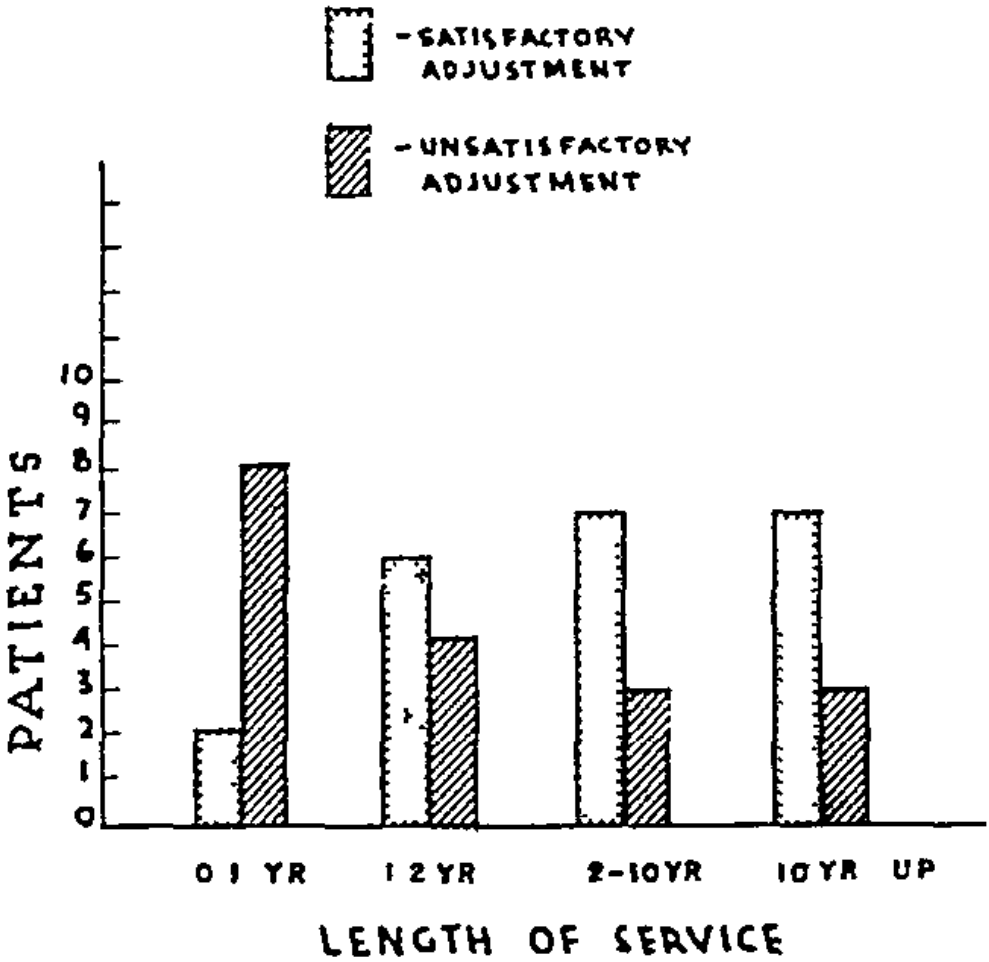


Figure 1 Social adjustme t pr or to ervice of pat t w th a duod nal lcer ac ord g to le gth of ervic prior to f t ho pit liz tion.

Figure 1 shows that the group of patients hospitalized within the first year of service contains the largest number who had previously unsatisfactory adjustments Only two of the group had previously satisfactory adjustments Although each group contains only ten patients there is a tendency for the number of satis factory adjustments to increase with the length of service but this trend only approaches statistical significance

Figure 2 is the same as figure 1 except that the occurrence of identifiable stress factors (military or personal or both) has been added Recognizable stress factors are found much more frequently in patients with previously satisfactory adjustments than in those with previously unsatisfactory adjustments in whom the role of such stress factors is much less apparent When all pa

tients are considered, there is a strong trend for the number of stresses to increase with length of service (significant at the 10 level of confidence) Of the 22 patients with previously satis

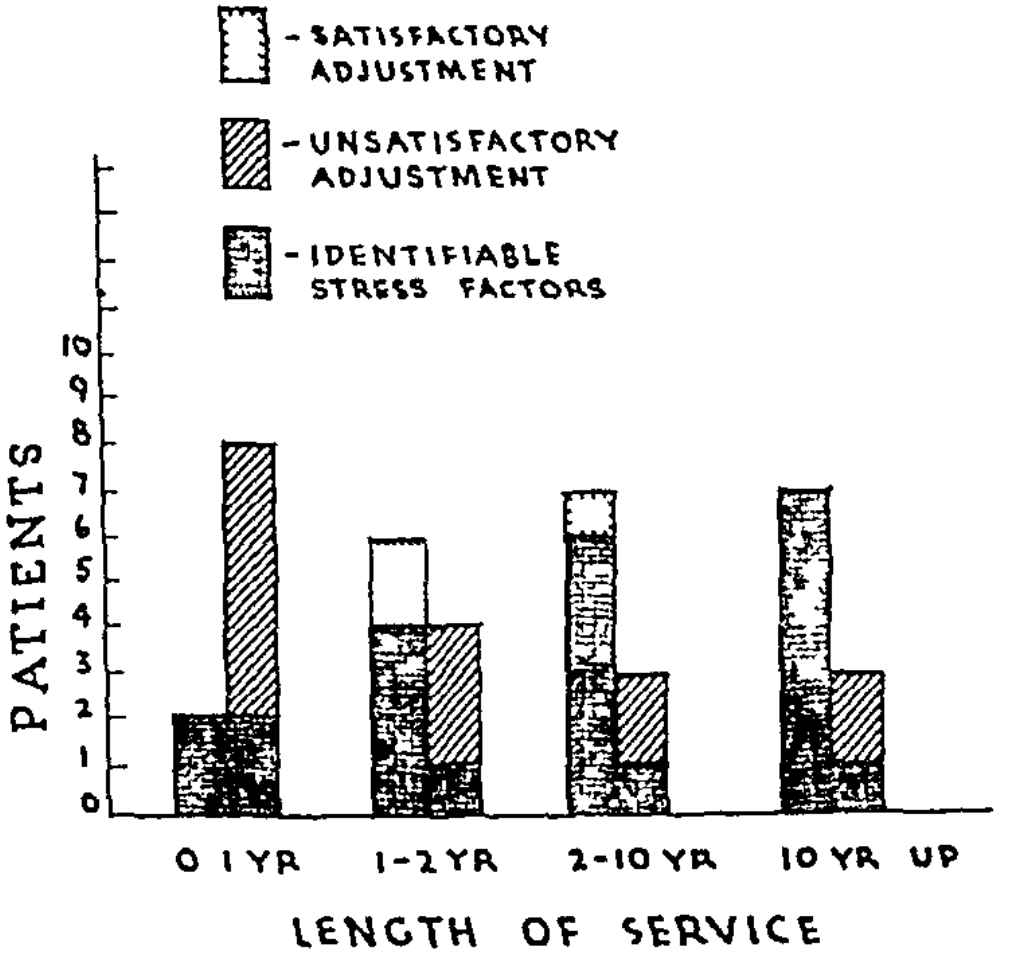


Figure 2 Relation of identifiable stress factors to previous social adjustment and length of service prior to first hospitalization.

factory adjustments, 19 (86 percent) had identifiable precipitating stress and only five (26 percent) of the 18 patients with previously unsatisfactory adjustments had such identifiable stress The comparison of the presence of stress factors in the two groups reaches statistical significance at the 01 level of con fidence

Table 1 gives a further breakdown of stress factors according to length of service, prior adjustment, and kinds of stress Of the 19 patients who had previously satisfactory adjustments and identifiable stress factors, five had only military stress fac tors, nine had nonmilitary stress factors alone, and five had a combination of both The number of nonmilitary stresses, either alone or combined, as opposed to the number of military stresses for all patients is statistically significant at the 05 level of con fidence

TABLE 1 *Th l t h p betw p us adjustm t l gth f rv d st s fa to*

L gth f	P d j m t	N mb f pa t	S f or				
			S p t	N m l y	M l y	B th	N t
0-1	S	2	2	1	1	0	0
	U	8	2	1	1	0	6
1 2	S	6	4	1	2	1	2
	U	4	1	0	0	1	3
2 10	S	7	6	2	1	3	1
	U	3	1	0	0	1	2
10 p	S	7	7	5	1	1	0
	U	3	1	0	1	0	2
T tal	S	22	19	9	5	5	3
	U	18	5	1	2	2	13

S = S f t ory
U = U f ory

The most striking trend is that motivation deteriorated in the patients who had more than two years of service (see table 2) Motivation was almost consistently poor and unchanged in patients with less than two years of service The difference between the two groups is statistically significant at the 01 level of confidence In the group with less than two years of service, only four were volunteer soldiers

Table 3 shows the presence of stress factors in those patients whose motivation deteriorated according to previous adjustment The presence of stress factors concomitant with deterioration of motivation was significantly higher in those patients with previous satisfactory adjustments than in those with previous unsatisfactory adjustments (05 level of confidence)

Personality characteristics of marked striving for success, fear of failure, and assumption of responsibility were used as identifying features of the typical "ulcer personality " Only ten of the sample population, all with previous satisfactory adjustment, displayed such characteristics Thus, significantly less than half of the patients studied conform to the classical ulcer pattern (significant at the 01 level of confidence)

DISCUSSION

One of the most conspicuous results of this study was the failure to detect the so-called "typical ulcer personality" in 75 percent of the patients This was especially striking in those patients rated as having unsatisfactory adjustments prior to service Not one of the 18 patients rated in this manner had personality characteristics usually ascribed to the typical ulcer patient Less than half of those having satisfactory adjustments fitted the pattern It is extremely improbable that such a proportion of ulcer cases studied would purely by chance so consistently fail to conform to the popular conception of "ulcer personality"

Patients with a history of poor social adjustment were predominantly nonvolunteer soldiers and had very little service Military or personal life stresses were not an obvious factor in the activation of a duodenal ulcer in these patients, or if so, these factors were not readily apparent In contrast, those soldiers with satisfactory social adjustment were predominantly volunteers, and activation of the ulcer followed a rather obvious emotional or situational stress Previous studies have indicated that the career soldier may perform well despite the presence of a recurrent duodenal ulcer but that the nonvolunteer will not respond well to medical management and will continue to complain until released from the military service [5] Our two groups of patients appear to correspond with those of Berk and Flood

TABLE 2 C mp f rr t nd p t m t t d g t l ngth f rv d p ev u adjustm t

L g h f rv	P dj tme t	N mb f p t t	Mot t			
			P t		C e t	
			S	U	S	U
0-1	S	2	0	2	0	2
	U	8	1	7	1	7
1 2	S	6	1	5	1	5
	U	4	1	3	0	4
Tot 1 1 th 2 y		20	3	17	2	18
2 10	S	7	7	0	2	5
	U	3	3	0	1	2
10-up	S	7	7	0	5	2
	U	3	2	1	0	3
T t l mor h 2 y		20	19	1	8	12

S = S sf tory U = U f y

Al h gh m lly d l h w mp d pr b f h g m O pat wh pr ly had sa
f y m d or d h pe t wh l h pa wh p usly h d uns f ory m va on mprov d l ng h me l
lue ha g d Thus h f gur d l h pr f pa lud d bl 3 wh m t d d d Th l
g if b w h w g p m ned h d f bl 2 or ff d by he ppa d pa y

TABLE 3 *Comparison of the presence or absence of identifiable stress factors in patients whose motivation deteriorated according to previous adjustment*

Kind of adjustment	Number of patients	Presence of stress	Absence of stress
Satisfactory	7	6	1
Unsatisfactory	6	2	4

Stress factors of a nonmilitary nature, or of a combined mili tary and nonmilitary nature, appear significantly more frequently in the patients studied than do stress factors of a purely military nature The preponderance of nonmilitary or combined stress fac tors is also significant when well adjusted patients are con sidered as a separate group Thus the diagnosis of an ulcer seems related more frequently to stress arising in the personal life of the patient than to that arising in the military service

In soldiers with ulcers, deteriorating motivation for military duty is seen significantly more often among those with two or more years of service prior to their first hospitalization than among those with less than two years of service This latter group displays an unchangingly poor motivation for military duty The consistently poor motivation could be expected in a largely nonvolunteer group No significant difference in motiva tion for military service was noted between satisfactorily and unsatisfactorily adjusted patients Among patients with deteri orating motivation for military service, stress factors appear significantly more often in the background of well adjusted pa tients than in the background of poorly adjusted patients Thus change in motivation is more likely to be secondary to stress in well adjusted patients than in poorly adjusted patients

It seems likely that the soldier whose previous adjustment was poor and who becomes ill under ordinary stress, or whose motiva tion deteriorates without external influence, will be ineffective in the Army regardless of whether he has a recurrence of his ulcer or not On the other hand, the person who was well ad-justed and was an efficient soldier until a major stress occurred is likely to continue to behave in the same pattern of efficiency as before, once he has recovered If the stress is recurrent, the ulcer is likely to recur

Adjustment, stress, and motivation are all significant factors in the activation of a duodenal ulcer Social evaluation furnishes valuable information concerning the individual patient and will be of material aid in his proper disposition It would seem wise

when personality factors and faulty social adjustment indicate that the patient with a duodenal ulcer will be an ineffective soldier to separate him from the service through psychiatric channels, the easy way out, *i e* separation of the emotionally unfit under the excuse that he has had a duodenal ulcer should be avoided The social case worker can help many of these patients solve the problems underlying their illness and may help reduce the recurrence of ulcer symptoms by helping the patient make a more satisfactory social adjustment.

SUMMARY

A social service study was made of 40 military patients having roentgenologic evidence of duodenal ulcer The patients were evaluated as to their social adjustment their personality characteristics the presence of stress situations which could have activated the ulcer and their motivation for military duty Patients with less than two years of service at the time of their first hospitalization more often had made poorer social adjustment to civilian and military life than those patients with longer service Identifiable emotional or situational stress seldom preceded activation of the ulcer in patients with an unsatisfactory social adjustment but was usually apparent in those whose social adjustment had been satisfactory Stresses in the personal life of patients were significantly more common than stress of a military nature Deteriorating motivation occurred more frequently in career soldiers and was secondary to stress more often in patients with previous satisfactory adjustments

Adjustment stress and motivation are all significant factors to be considered in the evaluation of ulcer patients and in determining their proper disposition Separation from the military service for a duodenal ulcer through medical service channels should be for medical reasons only separation through psychiatric channels would seem the proper course when personality factors and faulty social adjustment make it likely that the patient will be an ineffective soldier

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MEDICINE, WARFARE, AND HISTORY

JOHN F FULTON M D

IT is not commonly realized that many of the most significant advances in medical science have been made by medical officers in the armed services or by civilian physicians working under the stimulus of wartime exigency Whereas the ultimate compensations of war to any society are usually few and seldom recognized, in the field of medicine, over the years, they have been numerous and many of them highly important A number of examples may be cited from the historical record

In his illuminating series of notes on the history of military medicine, the late Colonel Fielding H Garrison[1] made the observation that while there were military surgeons in ancient times who occupied positions of responsibility and respect in the armies of Greece and Rome, it was the Swiss Confederation, in the fourteenth century, that antedated all other nations of modern Europe in state care of the wounded Municipal ordinances were issued notifying the individual soldier that his government was behind him and would look after his welfare on the field of battle The eminent historian Conrad Brunner[2] pointed out further that from the time of the battle of Laupen in 1339 the Swiss archives are replete with records of monies distributed for the care of the wounded and their dependents Brunner also discovered that barber surgeons were engaged by individual Cantons to attend the wounded after battle The Swiss thus set an example to all of the other warring countries of western Europe

In France in the 1470 s we find that Charles the Bold Duke of Burgundy, had placed a surgeon in each company of 100 lancers that is, one surgeon to 800 men It is also recorded that the lancers received £ 12 monthly from the Duke s coffers while his surgeon physicians received only £ 5 When Edward IV of England joined Charles the Bold in the campaign against Louis XI, he brought with him a chief physician two "body physicians" a surgeon and 13 assistant barber surgeons These men who

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attended the sick and wounded gained valuable experience for dealing with civilian problems injury and disease when the wars had ended

A century later we find Andreas Vesalius founder of modern anatomy serving as a military surgeon in the armies of Charles V His contemporary Ambroise Paré who lived through the reigns of seven French monarchs and served four of them not only introduced the ligature for arresting hemorrhage resulting from injury or amputation but also used antiseptic salves for dressing wounds A man of high character Paré spoke with authority and did more to place surgery on a modern basis as Vesalius had anatomy than any other person until the time of Joseph Lister Paré was also a pioneer in advancing the art of rehabilitation of the injured He devised many forms of prosthesis including wooden arms legs mechanical fingers false noses and ears—advances that again were adopted by civilian surgeons

During the seventeenth and first half of the eighteenth centuries advancement of military medicine proceeded slowly and there was no one comparable to Paré until the last half of the eighteenth century when James Lind the great British naval surgeon appeared on the scene There was however one notable figure in the seventeenth century Richard Wiseman who served the royalist armies in England throughout the civil war and after the Restoration and who was responsible for many improvements in surgical technic including the art of amputation especially in the case of gunshot wounds affecting the joints His book Severall Chirurgicall Treatises [3] published in 1676 is one of the important landmarks in the history of surgery both military and civilian

To James Lind M D (1716-1794) (to be distinguished from James Lind M D [1736-1812] also a Scotsman) of Edinburgh a surgeon long in the service of the Royal Navy we owe the first clear cut proof that scurvy can be prevented by the use of citrus fruits among sailors on long ocean voyages His Treatise on the Scurvy [4] published in 1753 is a classic and as a result of it a dread disease common not only among seamen but in civilian populations where citrus fruits are not readily available has been virtually eradicated Fully conscious of the importance of his discovery Lind wrote in the preface to the first edition

> The subject of the following sheets is of great importance to this nation the most powerful in her fleets and the most flourishing in her commerce of any in the world Armies have been supposed to lose more of their men by sickness than by the sword But this observation has been much more verified in our fleets and squadrons where the scurvy alone during the last war [ending in 1748] proved a more destructive enemy, and cut

off more valuable lives, than the united efforts of the French and Spanish arms "

WILLIAM BEAUMONT AND SILAS WEIR MITCHELL

In 1853 the American medical profession mourned the death of William Beaumont, U S Army surgeon, who, in addition to advancing the art of surgery in our armed forces, made a brilliant study of the processes involved in human digestion When Beaumont was stationed at an isolated army barracks in northern Michigan, a French Canadian courier, Alexis St Martin, was accidentally shot through the stomach Beaumont attended his wound with infinite care When it healed it left a fistula that Beaumont looked on not as a mere wound but as a unique opportunity to inspect his patient's stomach mucosa by direct vision and to study the rate of digestion of individual foodstuffs through action of the gastric juices He was also able to remove these digestive secretions and to study their action on food outside the body, a study that resulted in his celebrated monograph, "Experiments and Observations on the Gastric Juice, and the Physiology of Digestion,"[3] which so well exemplified Pasteur's famous dictum, "In the field of observation, chance favours only the mind which is prepared "

The United States armed services have had many other illustrious medical officers who have done original work through opportunity to study wounded men, ours as well as those of the enemy Many names come to mind, such as that of John Shaw Billings but no one during the Civil War occupies the position of Silas Weir Mitchell, a physiologist by training and a neurologist through special interest Mitchell with W W. Keen (who ultimately became a celebrated Philadelphia surgeon) and G R Morehouse, early in the Civil War (1861) had occasion to study peripheral nerve injuries and the sensory and motor disturbances that result therefrom Perusal of the protocols of their preliminary Circular Letter issued through the Office of the Surgeon General on March 10 1864,[4] and of the monograph that they published later in the same year,[7 8] makes it clear that Mitchell was the dynamic force behind the study His analysis of the problem illustrates his powers of observation and his genius for making sound physiologic deductions Among other things, Mitchell and his colleagues discovered that in certain cases following severance of an important nerve, especially when the nerve's disruption was associated with infection, there were abnormal sensory manifestations, *i e*, hyperesthesia in the extremity affected, a syndrome that Mitchell named causalgia The problem of causalgia has been studied for nearly a hundred years in both civilian and wartime cases of nerve injury and it came to be most actively studied during World War II, when its incidence was frequent.

In retrospect an even more important contribution of Mitchell and his collaborators lies in the clear cut description of primary and secondary shock Thus in discussing the various types of shock one reads in the circular on reflex paralysis The majority of physicians will no doubt be disposed to attribute the chief share in the phenomena of shock * to the indirect influence exerted upon and through the heart There are however certain facts which duly considered will we think lead us to suppose that in many cases the phenomena in question may be due to a temporary paralysis of the whole range of nerve centres and that among these phenomena the cardiac feebleness may play a large part and be itself induced by the state of the regulating nerve centres of the great circulatory organs But there do exist certain cases, more rare it is true in which singular affections of the nerve centres other than those of the heart occur as a consequence of wounds "

WORLD WAR I

During World War I there were many medical advances stimulated by the war itself particularly in the sphere of prevention of infectious disease It is said that when the Austrians attempted to invade the Balkans the front was held not by guns but by the louse and the devastating epidemics of typhus caused by the jumping creatures It is estimated that nearly a million Austrian soldiers poised on the Balkan border perished from epidemic typhus The Russian armies had much the same difficulty and so did those of other countries of western Europe Our soldiers were similarly troubled in the trenches on the western front but through use of hygienic methods there was far less devastation

On the basis of the experience of World War I every effort was made in World War II to protect our troops from typhus especially in the Mediterranean theater Meanwhile DDT the most effective insecticide then known had been introduced and was used by the Eighth Army under the direction of General Fox and General Hume to delouse the population of Naples and other points of southern Italy This practically abolished the typhus hazard among our occupation forces and the Italian civilians

It would be difficult to enumerate all the special branches of medicine that have benefited by war research but there is nothing so striking as the protection afforded our troops by mass inoculation particularly against tetanus To quote Brigadier General Elliott C Cutler chief consultant in surgery of the European theater of operations in World War II I would like to speak of the miracle which has occurred in eliminating tetanus from military surgery Let me recall some figures for you In our Civil War the mortality rate was from 89 to 95 percent Shortly before World War I under the benefit of antitoxin which was

discovered and elaborated upon by the use of animals the mortality rate had dropped to between 40 and 80 percent During World War I, large statistical evidence showed a mortality rate of 20 to 58 percent, but, in this second World War, there were only 11 cases known to have occurred amongst 10 700,000 men Of these 11 cases, 5 had been given toxoid and 6 had not More over, in these 11 cases, there are records of only four deaths, two of which occurred in individuals who had received the basic series of toxoid but no booster dose, and two in individuals who had not received even the basic series This is in my mind one of the great miracles of modern medicine The basis of the establishment of a proper toxoid rests squarely upon animal investigation and no greater debt could be acknowledged to our friends in the animal kingdom than this advance for the good of humanity "

In World War I many other lessons were learned, particularly the importance of moving casualties rapidly from the front lines before infection had set in The mortality incidence from battle casualties was far less than in the Civil War or the Spanish American War, but it was still high as compared with the mortality rate from casualties in World War II

Harvey Cushing took the lead in dealing with head wounds, and, while he worked slowly, much to the consternation of other Allied surgeons he took the rugged view that one wound well handled served a better purpose than a dozen hastily repaired wounds since in nearly all the latter cases the patients would die anyway His paper[1] published in the *British Journal of Surgery* in 1918 is still a classic of wartime cranial surgery and has been widely quoted by Hugh Cairns Eldridge Campbell and others who dealt with battle casualties in World War II

WORLD WAR II

Introduction of antibiotics Between World War I and World War II there were many important contributions useful not only in time of war but for medical and civilian defense Undoubtedly the most important were the developments in the field of the antibiotics Much research had been done on them before 1939 but their introduction as therapeutic agents was greatly expedited by World War II Sir Howard Florey and his resourceful team at Oxford were responsible for establishing the therapeutic potentialities of penicillin They were the first to isolate it in pure form they were also responsible for determining its effective dosage and for securing its large scale commercial production Several years ago when someone referred to penicillin as an outcome of wartime research Sir Howard protested, and his objections were well taken, for he had begun to work on the antibiotics in the early [illegible]

before penicillin could have been made available in large quantities had it not been for the stimulus of war The story of penicillin has been frequently told and need not be repeated here particularly since Sir Howard and Lady Florey have recently published detailed monographs in which the meaningful story of the antibiotics has been traced in detail

Surgery has probably been more benefited by wartime research than any other branch of medicine In World War I no surgeon would have dreamed of closing an infected wound or even one that was potentially infected without leaving a drain Now thanks to the use of chemotherapeutic agents such as the sulfonamides and penicillin it is possible to close wounds of almost every description even those of the abdomen without drainage and without fear of subsequent complication from infection provided all dead tissue has been carefully removed prior to the closure So great at one time did confidence become in the effectiveness of the new chemotherapeutic agents that some of the younger surgeons grew careless and began closing badly contused wounds without *débridement* *i e* without careful removal of seriously damaged tissue Such injured areas may be without circulation and they therefore become the foci of serious infection *since the bloodstream is unable to carry antibacterial agents* into such regions Penicillin thus cannot be regarded as a substitute for good surgery but merely a highly important adjunct These newer principles of traumatic surgery as worked out in the war theaters have had immediate application in all forms of civilian traumatic surgery and they are rapidly being adopted in our surgical clinics largely *through the influence of the* younger medical officers returning from active service

A second important result of the use of penicillin and the sulfonamides has been the avoidance of unnecessary amputations and unnecessary removal of potentially viable tissue With the greater confidence that these drugs are bringing to the surgeon *he is able to operate much less radically Formerly it was taught* that all contused tissue should be removed from an injured area but a contused muscle may still have an active circulation and therefore be capable of regaining its normal function When the thigh muscle or the calf has been injured by a high velocity missile the muscle is generally contused over a large area and a surgeon of the old school would in most such instances amputate rather than risk secondary infection During the last two years of World War II and during the Korean campaign countless extremities injured in this manner have been saved by combining penicillin therapy with conservative surgery One of the burning arguments however that one still encounters in surgical amphitheaters turns on the criterion of tissue viability how can a surgeon be certain that a contused muscle will recover it func

tion? The old adage ran, 'When in doubt, remove it" a newer epigram might be "If it bleeds, it can recover," and "When in doubt, leave it "

BLOOD FRACTIONATION

Surgery has also been influenced by wartime studies on human blood and the blood plasma fractions that have become available in pure form, again as a direct result of wartime medical research At the beginning of the war, much effort was devoted to the preparation of blood fractions suitable for transfusion Blood plasma (whole blood minus the red blood cells) was made available, but since many untoward reactions occurred from the transfusion of incompatible plasmas, and since under war conditions blood typing was often difficult or impossible, the plasma proteins were fractionated and the globulin fraction that carries the allergic potentialities of the blood was eliminated, leaving the albumins and fibrinogen Albumin was then prepared in pure form and was thus made available for immediate transfusion without fear of complications

It soon became obvious and this should have been clear from our experience in World War I, that when men have sustained severe hemorrhage whole blood is needed for transfusion, not merely plasma or albumin, since many weeks are required for the body to regenerate its red blood cells The British had attempted to collect and store whole blood in 1939, but their efforts were largely unsuccessful because of difficulties in preservation In 1943 an effective preservative was developed by the U S National Research Council and within a few months whole blood was being flown in enormous quantities to Europe as well as to all the outposts of our Pacific theater, as it is now being flown to Korea So effective is this service that blood drawn on the west coast was delivered in refrigerated containers less than 48 hours later at points such as Leyte, and at the end of the war it was quickly reaching Seoul and other points in the Korean theater

As a result of these investigations on blood and its fractions, the civilian surgeon has an imposing array of blood substitutes ready for his use at any time, and he is able to count on a supply of stored whole blood rather than having to find a blood donor at the scene of an accident or at some outpost of civilization He has also come to depend on two other significant blood fractions, namely, fibrin and thrombin which, thanks to the work of Edwin Cohn, Franc Ingraham, and others, are available in pure form and in combination can be used to stop the most stubborn hemorrhage *e g* bleeding from the brain substance or the liver which is notoriously difficult to arrest. A more homely use of the fibrin thrombin combination is for stopping a nosebleed or the hemorrhage that so often follows tooth extraction

Important new branches of medicine important to the armed services and to civilians alike have been created by wartime necessity Although no word has yet been coined to cover the great new area of chemical applications in disease control i e insect repellents insecticides and antimalarials which are now numerous because of our attempts to make military operations possible in tropical regions, this special field presents itself as a new and discrete branch of medicine and should be so recognized Just as Major Walter Reed and General William C Gorgas made possible the building of the Panama Canal through control of yellow fever so the repellents (against insect and shark) and the new insecticides made possible operations in the South Pacific in World War II that otherwise would have been too costly to contemplate Other new and significant branches that have developed are aviation and submarine medicine

AVIATION MEDICINE

Oxygen administration Progress in aviation, stimulated by developments in military aircraft has led to many advances of outstanding value both for medical defense and for civilian aviation One of these is oxygen administration During the First World War few fighter planes could achieve altitudes greater than 18 000 ft and the use of oxygen except in unusual instances was not deemed a prime military necessity hence such oxygen masks as there were were crude in design and wasteful from the point of view of oxygen supply The need for oxygen masks was well known however from early balloon ascent and particularly from the tragic Tissandier disaster which occurred on 15 April 1875 Three men had ascended in a balloon to an altitude of 28 000 ft , and all three were overcome by altitude sickness before they could breathe the oxygen that they had on board As a result two of the balloonists Croce Spinelli and Sivel succumbed and Tissandier alone of the three survived The intrepid French experimenter Paul Bert established the fact in a homemade pressure chamber that it was not low pressure as such that had caused the death of the two balloonists but rather the low pressure of oxygen at 28 000 ft Paul Bert exposed himself along with a bird and a rat to a pressure of 430 mm Hg The bird vomited and appeared quite sick and at a slightly higher altitude the bird was close to death and the rat uneasy At that point Professor Bert became dizzy and his pulse had increased from 60 to 86 He then began to breathe oxygen his dizziness disappeared, and his pulse within two minutes had dropped to 64 but it was still impossible for him to whistle He continued his ascent to an altitude equivalent of 29 000 ft (4?8 mm Hg) at which time the bird was prostrate and a burning candle had turned very blue with its flame almost extinguished

This celebrated experiment made it quite clear that oxygen must be available if planes without pressure cabins were to ascend to altitudes above 18,000 ft Further study carried out during World War II made it clear that vision, mental alertness, and the capacity to fly a plane with safety began to diminish at altitudes as low as 5,000 ft, this being particularly true of night vision Hence, when military aircraft began to ascend to altitudes of 25 000 and 30,000 ft and later to 40,000 and 50,000 ft * the problem of oxygen supply became acute and all the problems worked out for military aircraft were immediately applicable to commercial planes carrying civilians It has been said that the Battle of Britain was won with a few oxygen masks In a literal sense this is perhaps true, because Hitler s military pilots, both fighters and bombers, began in the summer of 1940 to come in at altitude ceilings well above the tolerance of an ordinary flier and they had developed systems of oxygen supply that for a brief time were superior to those of British fighters Thanks to the efforts of the Flying Personnel Research Committee and particularly to one of its members Sir Brian Matthews, the British developed a successful oxygen mask and a system of supply that made it possible for British fighters to meet German raiders at their own altitude and through this circumstance the Battle of Britain was won virtually in a single day, 15 September 1940 when 186 German planes were shot down The *Luftwaffe* quickly decided it could no longer stand this rate of attrition The British were tireless in their efforts to improve their oxygen masks and modes of supply, and our own air forces profited immeasurably by British experience, which was made freely available to the U S Army and Navy Air Forces

Pressure cabin aircraft * * It early became obvious to some investigators including Paul Bert that if the gondola of a high altitude balloon were artificially pressurized a balloon might ascend higher into the atmosphere without endangering life But years passed and it was not until 1933 that the National Geographic–U S Army stratosphere flight was able to make an ascent in a pressurized gondola with adequate pressure control In this memorable ascent Stevens and Anderson of the U S Army Air Corps achieved an altitude of 72 395 feet

The experience encouraged the U S Army Air Corps to think of pressurized combat aircraft, and to Harry G Armstrong now Surgeon General of the U S Air Force must be given credit for having, through a historic Air Corps technical report, outlined

In th *Illustrat d Lond n News* fo 16 May 1953 t rep rted that on 4 May new Engl sh turbo-j t b mber (Canbe ra type) a h d an authe tic ted lititud f 63 668 ft wh ch tand a th lt tude rd fo he -than-air machin s under human at l

Th mar ial a th s nd th f ll w ng t n based ref n e 16 and 17

the physiological requirements of sealed high altitude aircraft compartments This was a starting point for developments of *pressurized planes in this country the first of which (the* \C 3) was flown in April 1937 In this development the United States was ahead of both Britain and Germany and thanks to the enterprise of the Lockheed Aircraft Corporation finally succeeded in making their stratoliners (B 307) and Constellations effectively pressurized After 1946 Constellations began to make regular transatlantic flights at altitudes ranging from 18 000 to 24 000 ft. while the pressure in the cabins was maintained at an average corresponding to 8 000 ft.

Technical difficulties in pressure cabin aircraft prove numerous and for the most part they stem from man s physiological requirements *i e* maintaining cabin pressure and of almost equal importance adequate ventilation The average air passenger *without lung or heart disease and under the age of 70 is quite* comfortable at an altitude of 8 000 ft even though at that height his night vision may be somewhat impaired But ventilation of the fuselage presents a very real problem because of the accumulation of water vapor and carbon dioxide also in hot weather body odors and fumes from aircraft instruments and engines demand rapid change of air at appropriate pressure In a completely sealed cabin a change of air of 2 to 3 cubic feet per minute per person will keep the humidity and the carbon dioxide at a tolerable level provided there are no exhaust fumes Leaks in the pressure cabin equipment are inevitable however and with further experience it became evident that a change of at least 12 cubic feet per minute per person would be essential for comfortable air travel This involved installation of larger turbo pressurizers and air coolers to make the pressurized air tolerable from a thermal standpoint Through experience gained during World War II these difficulties have now been largely overcome and essential equipment has now been installed in all long range high flying pressurized passenger aircraft

Explosive decompression An ever present hazard in pressurized aircraft both military and commercial is that of sudden or explosive decompression Pressurized aircraft such as the Constellation is stressed to withstand a pressure differential of 6 5 lb per square inch This would permit flight at 30 000 ft. with an internal pressure equivalent of 8 000 ft If a large military aircraft flying at 30 000 ft were suddenly depressurized by enemy action the pilot if he had oxygen available could carry on but other crew and passengers without oxygen would retain useful consciousness for about two minutes If no oxygen were available crew and passengers would become unconscious within a matter of minutes and death might ensue within a period of 8 to 10 minutes Hence commercial planes in which explosive de-

compression might occur as a result of the breaking of a window, failure of turbos, or explosion of an observation dome, are not permitted to fly above 22,000 to 24 000 ft., since a large plane cannot descend rapidly enough to insure consciousness of the occupants, especially of the crew

With military planes, which ascend to much greater altitudes the situation is even more critical For example if pressurized military aircraft were flying at 52 000 ft and were suddenly decompressed, the pilot would have only 15 to 20 seconds to get himself out of the plane and, if he did not descend within three three to five minutes through free fall to 20,000 ft , his heart would have stopped A direct pressure dive might enable the pilot to achieve 15 000 20,000 ft but he would be unconscious when he reached that level In view of this circumstance it has been deemed safer to bail out for a free fall with a parachute that will automatically open at 10,000 to 12,000 ft With rockets and the much talked of space ship, which will fly through ether in which there is no pressure and no oxygen the paramount importance of maintaining adequate pressure levels is obvious and the energy required to maintain pressure, let alone jet propulsion, is so great that even the most optimistic are loath to predict that the problem of fuel supply could be solved, despite all the resources of human ingenuity, within the life span of this generation Perhaps one might reach the moon, but how would energy be secured to insure return? More difficult conundrums have been solved in the past but, although I happen to be an optimist with faith in the resourcefulness of some future generation I believe that the only possible solution lies in atomic energy with all its weighty paraphernalia "And so it turns out that in man's quest for mastery of the air a great step forward has been taken in the successful development of pressurized cabins These developments, however are in their early infancy from the engineering standpoint and their use in larger transport planes in rockets and jet-propelled craft, will succeed only if the limitations of the human frame, both in its structure and in its functions, are kept constantly in mind And let us not forget that it was a flight surgeon and not an engineer who wrote the specifications for the first pressurized plane [16]

Acceleration in high speed aircraft The successful use of oxygen presupposes a steady blood circulation without undue gravitational pressure on the heart however it became obvious to the French flight surgeons in 1918 that rapid turns and dive pull outs tended to diminish the flow of blood to the brain In the Snyder Trophy Races in 1929, confusion and dimming of vision were encountered when the pilots were rounding the pylon and in 1932 a man of great insight Heinrich von Diringshofen of the German Air Ministry Research Laboratories at Tempelhof in

Berlin constructed a human centrifuge to simulate problems of acceleration in flight Before this however two equally thoughtful Dutch investigators Jongbloed and Nooyons of Utrecht had studied the effects of acceleration on the level of the systolic blood pressure in animals As a plane s speed is augmented or diminished the pilot is pushed backward or forward in his seat by a force directly proportional to the rate of acceleration or deceleration If the increase of speed occurs at 32 9 ft. per second the pilot would be pushed against the back of his seat by a force equal to that of gravity but when pilots pull out of dive bomb maneuvers the direction of the acceleration is from head to foot and as far as the circulation is concerned there is a tendency to pull blood from the head

Need for protection from high acceleration in aircraft has become even more acute in the last few years owing to the development of the fast-flying jet plane and the possibility of using rockets for human transportation Even when planes were unable to fly at rates of more than 200 to 300 miles per hour acceleration had become a vital problem especially in dive bombers and in fighter aircraft that were able to make fast turns Now that jets are achieving speeds of 500 to 700 miles per hour the need for protection from acceleration is vitally increased The pneumatic pressure suit developed by Captain John Poppen MC USN Prof F A S Cotton in Australia and Dr Harold Lamport in New Haven Conn and many others has served to give measurable and strategically significant protection for military pilots Such suits have proved of inestimable value especially during the D Day operations and more recently for our fighter pilots in Korea

Design for safety During the war there were many instances in which a fast flying bombing plane crashed into a mountain side and everyone on the plane except for the tail gunner was instantly killed Accidents such as this have stirred inquiry into the reasons for these apparently miraculous survivals They lie in the fact that the rear gunner s head and the rest of his body were supported by solid structure at the time of the impact and in the fact that he was riding backward Those situated in a more forward position in a crashing airplane are thrown from their seats because of insufficient strength of seat belts and seat moorings and according to the wartime report of Whittingham director general of medical services of the R A F (and now of B O A C) 95 percent of the deaths in air crashes result from head injury *i e* the head of the passenger is thrown violently against solid structure

It became obvious in view of episodes such as these, that rear facing heavily moored seats would confer a degree of pas

senger safety at least 10 times as great as that which could be achieved with forward facing seats with fragile seat belts to hold the passenger in place in the event of accident The British public and airplane manufacturers have already seen the virtue of rear facing seats, and many of their new passenger planes are so equipped In the United States the resistance on the part of both the flying public, and more particularly the aircraft designers, has been so great that to date only Northwest Airlines have seen fit to install rear facing seats in commercial craft.

The principles involved in the greater safety from rear facing seats are simple If one falls to the ground and strikes one's head on soft earth, the head is decelerated in a matter of a few tenths to one half a second the blow being thus softened, the accident victim may not suffer concussion or unconsciousness When, however, a person knocked off a bicycle strikes his head on solid cement that does not yield, he may suffer fracture of the skull, concussion, hemorrhage, and possibly even death In these circumstances the head is decelerated in a matter of a hundredth of a second or less, depending on whether the falling person has on his head a soft felt hat or a football helmet Crash helmets to minimize sudden deceleration of the head are now in use in almost every military aircraft, since pilots unfortunately, are unable to occupy rear facing seats with present flight equipment.

Mr Hugh De Haven, director of crash injury research at Cornell University Medical College in New York, is, among others, responsible for stressing these considerations In this connection one of his most impressive studies has been the analysis of nonfatal suicide leaps in the city of New York Persons have survived virtually uninjured after leaps from the tenth and even the seventeenth floor of New York buildings, and, when the circumstances are analyzed in any given case, it turns out that the intended suicide victim has usually landed flat on his back in a soft garden plot or on a ventilating screen, or his fall may have been broken by awnings or an automobile top This again indicates the importance of gradual rather than abrupt deceleration These principles have proved to be immediately applicable not only in aircraft design but also in the automotive industry A summary of these considerations had been given in Hugh De Haven's Development of Crash Survival Design in Personal, Executive and Agricultural Aircraft. [19]

The literature of aviation medicine, the great part of which has come from military installations affords many other examples of material that is immediately applicable to commercial aircraft and to the automotive industry It stresses the importance of having men of vision, imagination determination and sound training in the medical departments of all our military services for the con

tributions they make are likely to be of importance not only to military operations but to society in the broadest sense

SUBMARINE MEDICINE

Submarine medicine offers many examples of scientific disclosures with general application but they are of less immediate significance to the civilian public at the present time since it is not much given to traveling in submersibles except for a few hardy souls such as William Beebe who study marine life at great depths in the sea and the frogmen who do mysterious things at depths of 100 or more feet in the interests of national defense Of course the diver and the caisson worker can always learn much from submarine experience, especially about protection from caisson disease and diver s bends * There is no journal of submarine medicine but the physiologic problems encountered by submarine personnel are numerous and the literature pertaining thereto has been analyzed summarized and systematically arranged in a remarkable bibliography by Commander Ebbe C Hoff MC USNR entitled A Bibliographical Sourcebook of Compressed Air Diving and Submarine Medicine published by the Navy Department through the Government Printing Office in February 1948 The bibliography contains nearly 3 000 entries each of which is summarized and reviewed in subject groups It does not fall within the scope of this paper to discuss the technical phases of submarine medicine but attention should be directed to h E Schaefer s comprehensive monograph (826 pages) on German submarine medicine Dr Schaefer chief of the Submarine Physiological Laboratory at Heidelberg during the war is now continuing his important studies in the physiology branch of the U S Naval Medical Research Laboratories at New London Conn His recent reports from the submarine base should also be consulted.

In closing this historical survey on the importance of military medicine to national and civilian defense I can do no better than to quote the words of Captain J S Taylor MC, USN * written after World War I The world was far from even apprehending what it has yet to learn thoroughly that in the field the distribution of medical supplies prompt evacuation skillful first aid shelter, food and restoratives available early for every fallen combatant are of infinitely more importance than highly technical relief to difficult cases More critical still are the problems relating to later demobilization to hospitalization and rehabilitation of war victims and the faithful but well ordered and economical relief of the wreckage of war Millions will be spent and more millions wasted until the time comes when it is a recognized part of the program of national defense to organize methods of post bellum relief at the same time that activities are initiated for the prosecution of hostilities We have progressed from the day of medical attendance for leaders to medical attend-

ance for all combatants, and leaders are increasingly alive to the immediate necessary needs of their forces, but we have not yet attained to a comprehensive grasp of the requirements or possibilities of military medicine

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ARMY NAVY AND AIR FORCE MEDICAL OFFICERS GIVEN AWARDS AT MILITARY SURGEONS MEETING

Majo Wallis L Craddock MC USAR Fort Dougla Utah was awarded the Sir Henry Wellcome Prize and Medal fo 1953 on 11 Novem ber dur ng the sixtieth annual meeting of the Association of Military Surgeons n Washington D C for his essay on An Evaluation of the Pulmonary Features of Systemic Fungus Disea e An Army and an Air Force officer received honorable mention for their p per on The I guinal Hernia Problem V ewed Fr m the Standpoi t of Recurrent Cases The authors were Colonel Warner F Bowe s MC USA and Major Evan W Schear USAF (MC) both of B ooke Army Hosp tal Tex

The Fou ders Medal of the Assoc ation f rst authorized in 1941 on the occasion of the fift eth anniversary meeting was presented to R ar Admiral Bertram Groe beck Jr MC USN (ret) Indianapolis Ind and to Rear Admiral W nfred P Dana MC USN and Commander Frank B Voris MC USN of Wash ngton D C

The Gorgas Award fo 1953 was giv n jointly to Colonel Douglas B Kendrick MC USA Un ted States Military Academy and Captain Lloyd R Newhouse MC USN Bureau of Medic and Surgery D pa t ment of the Navy Washington D C fo their achievements in col labor ting on the dev lopment of blood subst tutes for f eld use prior to and during World W II

Th Seaman Award fo the most notable c ntr bution published in the *M l tary Surgeon* dur ng th y r was given Colo l No man T Elton MC USA Edgewood Arsenal Md

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Dr Robert Abbe (1851 1928) is the f ther of radiotherapy in the United States He brought the first radium to this country in 1903 and used it in the treatment of patient w th carcinoma

AN ANALYSIS OF HOSPITAL RECORDS OF PATIENTS DISCHARGED FROM A LARGE TUBERCULOSIS SERVICE

Use of Punch Cards in Evaluating Data From 1 423 Cases

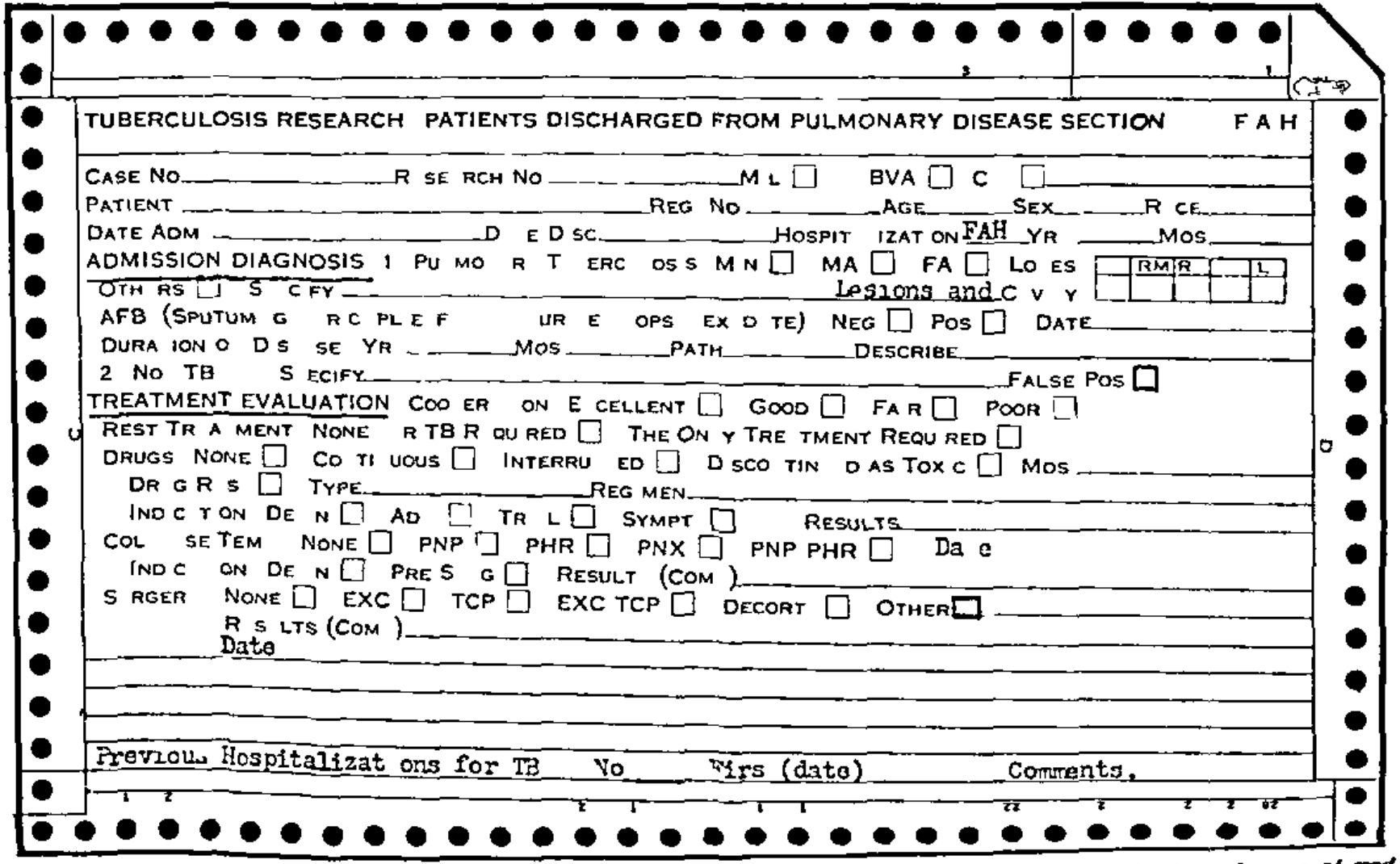
CARL W TEMPEL *Colonel MC USA*
FORREST W PITTS *Captain, MC USA*
ROBERT L MAYOCK *Captain MC USA*
WILLIAM W STEAD *Captain MC USA*
JOHN B PLUM *Lieutenant Colonel MC USA*
KENNETH T BIRD *Captain MC USA*
JAMES H SANDS *Captain, MC USA*
FRANCISCO T ROQUE *Major MC USA*

MORE advances have been made in the treatment of tuberculosis during the past decade than were accomplished during the previous half century Measurement of success and failure during this interval therefore assumes unusual importance It is only by careful evaluation of each patient that the extent of progress can be accurately assessed Furthermore, this is the first step in the accumulation of clinical data on large numbers of patients to be used for retrospective studies Follow up studies of patients with tuberculosis to evaluate treatment cannot be made unless certain basic facts are available Such information must include the type, extent, and duration of disease as well as sufficient detail on the nature and results of therapy employed to evaluate its precise role

CARD FOR EVALUATING THE TREATMENT

A punch card* was designed to record diagnostic, therapeutic, and administrative data (figs 1A and 1B) This information was furnished by the ward physicians from the 1 200 bed tuberculosis service The cards, as well as representative roentgenograms,

From Fitzsimons Army Hospital Denver Colo
Hyman Spector Memorial Lecture St Louis University 20 April 1953
*Keysort card manufactured by McBee Co was used in this study



TUBERCULOSIS RESEARCH PATIENTS DISCHARGED FROM PULMONARY DISEASE SECTION F A H

CASE NO. _____ R SE RCH NO _____ M L ☐ BVA ☐ C ☐

PATIENT _____ REG NO _____ AGE _____ SEX _____ R CE _____

DATE ADM _____ D E D SC. _____ HOSPIT IZAT ON FAH YR _____ MOS _____

ADMISSION DIAGNOSIS 1 PU MO R T ERC OS S M N ☐ MA ☐ FA ☐ LO ES ☐ RM R ☐ L

OTH RS ☐ S CIFY _____ Lesions and C V Y

AFB (SPUTUM G R C PL E F UR E OPS EX D TE) NEG ☐ POS ☐ DATE _____

DURA ION O D S SE YR _____ MOS _____ PATH _____ DESCRIBE _____

2 NO TB S ECIFY _____ FALSE POS ☐

TREATMENT EVALUATION COO ER ON E CELLENT ☐ GOOD ☐ FA R ☐ POOR ☐

REST TR A MENT NONE R TB R QU RED ☐ THE ON Y TRE TMENT REQU RED ☐

DRUGS NONE ☐ CO TI UOUS ☐ INTERRU ED ☐ D SCO TIN D AS TOX C ☐ MOS _____

DR G R S ☐ TYPE _____ REG MEN _____

IND C T ON DE N ☐ AD ☐ TR L ☐ SYMPT ☐ RESULTS _____

COL SE TEM NONE ☐ PNP ☐ PHR ☐ PNX ☐ PNP PHR ☐ Da e

IND C ON DE N ☐ PRE S G ☐ RESULT (COM) _____

S RGER NONE ☐ EXC ☐ TCP ☐ EXC TCP ☐ DECORT ☐ OTHER ☐ _____

R S LTS (COM) _____

Date

Previous Hospitalizat ons for TB No Yrs (date) Comments.

Figu 1A F t f ca d us d to ord d gno be p md dm i na va da e on va y pa ie d ha gad or rawa/ rred

FINAL STATUS ON DISCHARGE IMP ☐ UNCH ☐ WORSE ☐ CLASSIFICATION TB ☐ NON TB ☐
1 TB NTA DIAG /// MIN ☐ MA ☐ FA ☐ ACT ☐ ARR ☐ INACT ☐ EX STAT ☐☐☐☐5
Extra Pul TB
A DISCHARGED WITH MAXIMUM HOSPITAL BENEFIT
1 PATIENTS WITH ACTIVE DISEASE ON ADMISSION
(A) TREATED TO INACTIVE STATE, arrested ☐
(B) DISCHARGED AS GOOD CHRONIC ☐
2 INACTIVE ON ADMISSION – NO RX FOR TB ☐
3 INACTIVE ON ADMISSION – RX FOR RESIDUALS ☐
B TRANSFERRED TO ANOTHER HOSPITAL ☐ Place
C DIED CAUSE (include contributory) ☐ Cause
D IRREG DISCH (AWOL AMA DISCIP ADMIN) others ☐ Type
2 NON TB TRANS TO NON TB WARD FAH ☐ DISCH FROM HOSP ☐ ALSO HAD INACT TB ☐
ADMINISTRATIVE DISPOSITION – MILITARY PATIENT (S)
LOD YES ☐ NO ☐ SERVICE AGGRAVATED ☐ FRAUD ☐ OTHER
DISPOSITION DUTY GENERAL ☐ LIMITED ☐ RETIRED PERM ☐ TEMP ☐ OTHER
ADDRESS ON DISCHARGE (permanent-home):
REMARKS
Interesting-instructive case: No/ / Yes/ / Explain
REPORT PREPARED BY WD

Figure 1B Reverse side of card shown in figure 1A

CODE A (t p n mbe f ard)

TYPES OF PATIENTS 1-4
1 M l tary
2 V
3 C lia
4 F mal m l tary

ADMISSION DIAGNOSIS 5 10
5 M mal
6 Mod t ly d d
7 F d ed
8 Pl ur l ffus d t tube l
9 Oth r t be ul us l
10 P lm ry tat pl t

DURATION OF TUBERCULOSIS ON ADMISSION 11 13
11 L h l y
12 1 3 y
13 3 5 yea

PULMONARY PATHOLOGY ON ADMISSION 14 18
14 N w ud l
15 N w us p um l
16 Old, f b oc l
17 M d w d ld l ns
18 M l ry be l
19 24 R rv d for f ur us

CODE ALPHA (typ f m l tary p)
1 R gula Army
2 Air F
4 R rv ff
7 E lis d R is

CODE B (bo m umb t d)

TREATMENT EVALUATION 1 26
1 R t ly
2 Ch m ther py
3 0-4 m th
4 5 8 m th
5 9-12 m th
6 13-18 mo ths
7 19 24 m th
8 24 m hs
9 Dr g the py in us
10 T mpor ry ll p
11 P um pe um
12 Ph mphr
13 P m thor
14 Surg ry
15 E
16 Th pla ty
17 E thor pla ty
18 De t
19 Oth urg y
20 T mp ary ll p p d urg ry
21 E
22 Th pl ty
23 E h pl y
24 D
25 Oth urg y
26 Oth p l d
27 Co-op ra ll g od
28 Co-op f ir p
29 R rv d f f ur

CODE C (l f d f ard)

PATIENT S CONDITION ON DISCHARGE 1 3
1 Imp d
2 U h g d
3 Wor

DISEASE STATUS ON DISCHARGE 4-8
4 Min mal
5 M d ly d d
6 P d d
7 Oth b ul l
8 N be l d

TYPE OF DISCHARGE FOR TUBERCULOUS PATIENTS 9 17
9 T d na tag
10 D ha g d good hr
11 Ina — m qui d
12 Ina —tr m t f idual
13 T f rr d th h p l
14 D d
15 I g lar (n- p p)
16 Admi tr
17 Oth d harg

CODE D (gh d f d)

MILITARY PATIENTS ADMINISTRATIVE DISPOSITION 1 14
1 Lin f d ty—Y
2 L f d ty—N
3 L f d ty rvic gg t
4 Gen l d ty
5 R d l m d d ry
6 P ma tir m t
7 P ma ir m VA h p tal
8 T mporary ir m
9 T mp y tir m VA h p l
10 E pir m f
11 E pir m f rv VA h p l
12 O h (Co G) h m
13 O h (C G) VA h p tal
14 Oth d po l ed
15 16 R rv d for f tur

F gur 2 C d mbe for p h card

were reviewed by a panel of four physicians Entries were then coded (fig 2) by cutting the appropriate holes at the margin of the card By this technic a tabular analysis of the data was quickly performed The statistical tables 1 through 7 illustrate the type of information that can be made readily available for the study of trends in the treatment of tuberculosis and for the tabulation of work accomplished for annual and other hospital reports

RESULTS

During 1952 1,423 patients were discharged from the tubercu losis service of Fitzsimons Army Hospital (table 1) There were 1 184 patients observed or treated for tuberculosis (table 2) Eighty seven were judged to have been inactive on admission, 931 were transferred to other hospitals in keeping with Army re tirement procedures, and 35 received administrative discharges because they became ineligible for military hospitalization The results of therapy were not evaluated in these 353 patients Ac tive tuberculosis was present in 266 of these 353 patients There were 28 patients with minimal disease, 123 with moderately ad vanced, 92 with far advanced, 17 with tuberculous pleurisy with effusion and 6 with extrapulmonary tuberculosis The remaining 1,070 patients will be discussed under the following five cate gories

1 Patients without tuberculosis	239
2 Patients with tuberculosis treated until disease became inactive	541
3 Deaths from all causes	35
4 Patients with tuberculosis discharged as "good chronic"	24
5 Irregular" discharges among patients with tuberculosis	231

1 *Patients without tuberculosis admitted with a diagnosis of tuberculosis*

Two hundred and thirty nine patients were admitted to this hos pital with a diagnosis of tuberculosis by referring physicians, and it was subsequently determined that nontuberculous pulmonary disease, or inactive pulmonary tuberculosis with an associated disease, or no evidence of disease existed (table 3) These diag nostic problems constituted 17 percent of the 1 423 patients dis charged Most were asymptomatic Most of the symptomatic pa tients presented a vague nonspecific type of history, and only an occasional patient was acutely ill

In spite of numerous studies, including exploratory thoracotomy in 31 patients (13 percent), the exact cause could not be estab lished in many patients Forty patients were discharged with a

diagnosis of pulmonary calcification and/or fibrosis of undetermined cause Tuberculin coccidioidin and histoplasmin skin tests revealed multiple positive reactors and therefore frequently lacked diagnostic value in some patients Stable roentgenograms over a period of many years were the most important single factor necessary to establish the diagnosis of pulmonary fibrosis

TABLE 1 *T t l mb f pat t b rv d t t d d d h g d f m th t b cul s sen*

D g	N mbe f P t t	P t
N t be ulou d ea	239	17
T be l s	1184	83
Pulm y	(1030)	
M mal	(221)	
M d rat ly d n d	(507)	
Far ad d	(302)	
Pl ur l ff	(115)	
E p lm y d e	(39)	
T tal	1423	100

Adm d w h p mp d g f be l

TABLE 2 *A luat f th typ f d p t m d f ll t b l p t t*

D gn a d d p it on m d	P t t	
	N mb	P r t
1 D h g d w th ma mal h p t l b f t	652	55 0
T t d t na t g	541	45 7
D ha ged g od h	24	2 0
In ct o dm on	87	7 3
2 T sf d t oth ho p tal	231	19 6
3 D d	35	3 0
4 Irr gul (un o-ope t p t ts)	231	19 6
5 Adm str t d ha g	35	3 8
T tal	1184	100 0

Mycotic disease simulating tuberculosis was found in 44 p tients Twenty eight of these were proved to have co c mycosis and 16 to have histoplasmosis Assignment of troops areas where these diseases are endemic has lead to an awareness of the practical diagnostic problems involved

TABLE 3 *Analysis of patients with nontuberculous disease admitted to this hospital with an original diagnosis of tuberculosis*

1 Infection and sequelae	
a Fibrosis and/or calcification pulmonary cause undetermined	40
b Pulmonary mycotic diseases	
Coccidioidomycosis	28
Histoplasmosis	16
c Bronchiectasis	24
d Pneumonia acute and subacute	19
Bronchopneumonia chronic	15
f Pleurisy with effusion nontuberculous	4
g Bronchitis chronic	3
h Abscess lung	3
Pleuritis chronic nontuberculous	3
j Lymphadenopathy mediastinal	3
k Emphysema pulmonary	3
l Paragonimiasis	1
2 Pneumoconiosis (silicosis)	3
3 Tumors and cysts	
Neoplasm lung	4
b Bronchogenic cyst	1
4 Allergic disorders	1
5 Congenital anomalies and structural changes	
Achalasia esophagus	1
b Pneumothorax spontaneous	3
6 Trauma	
a Hematoma lung	5
b Fibrosis of pleura	1
7 Foreign bodies aspiration	
a Lipoid pneumonia	1
b Foreign body retained left lower lobe bronchus	1
8 Blood vascular and circulatory disorder	
a Pulmonary embolism with infarction	4
b Vascular anomaly arteries right upper lobe	1
c Hemoptysis cause undetermined	2
9 Disease unknown cause (sarcoidosis)	1
10 Artifacts extrinsic shadows	0
11 Combined lesions	
a Inactive tuberculosis with other pulmonary disease	7
b Inactive tuberculosis with extrapulmonary tuberculous disease	4
12 Unclassified and other lesions	
a Observation medical pulmonary disease found	31
b No pulmonary disease but extrapulmonary dis	
Rheumatic heart disease	1
Abscess muscle left triceps	1
Osteomyelitis acute right humerus	1
Observation renal disease	1
Lymphadenopathy nontuberculous axillary (cat scratch fever)	1
Pericarditis with effusion nontuberculous	1
Total	239

TABLE 4 *Typ / therapy us d 431 pal ent u th pulmonary t bercul u.bo u e t at d unt l d as ach d act tag*

Typ f m	M m l	M d d ly d	F d d	T l	
				N mb f p	P
M d l m ur	104	196	34	334	77 5
R t ly	5	0	0	5	1 1
Ch m h rapy d	58	37	3	98	22 8
T mp y ll p d ug d	41	159	31	231	53 6
P um h	(0)	(2)	(0)	(2)	(0 5)
Ph mph	(2)	(1)	(0)	(3)	(0 7)
Ph mphr w h p um p um	(0)	(5)	(1)	(6)	(1 4)
P um p m	(39)	(151)	(30)	(220)	(51 0)
Surg l p dur dr g d	24	55	18	97	22 5
Th pl ty	0	3	9	12	2 8
All	24	52	9	85	19 7
P lm nary	(12)	(13)	(0)	(25)	(5 8)
R h pl ty	(12)	(39)	(9)	(60)	(13 8)
T l	128	251	52	431	100 0

TABLE 6 *E aluat on f 831 pat t w th tubercul und g mg d f tw t tment*

R ult f t tm t	Typ f p			T l	
	M l y	V	C il d p d	Numb	P
S f l (p n tr d na tag)	383	81	77	541	65 0
F lur	17	225	48	290	35 0
Ir g l d h g	12	179	40	231	27 9
D th	5	28	2	35	4 2
G d hr on d ha g	0	18	6	24	2 9
T l	400	306	125	831	100

inactive disease" as defined by the 1950 National Tuberculosis Association Diagnostic Standards This rigid criterion for discharge of patients undergoing treatment was met in 541 patients discharged in 1952

Tuberculous pleurisy with effusion Of 91 patients discharged with inactive tuberculous pleurisy with effusion, 72 received streptomycin para aminosalicylic acid therapy, and 19 were treated with rest alone Decortication was performed on three patients Moderate or marked roentgenographic improvement was noted in 88 percent of the group while none became worse The mean duration of hospitalization was 12 months No return to full time employment for one year following discharge was advised

TABLE 7 *Evaluation of 366 patients with moderately advanced pulmonary tuberculosis discharged*

Factor evaluated	Type of patient			
	Military	Civilian dependents	Veterans	Total
Number of patients	172	58	131	366
	Percent	Percent	Percent	Percent
Successfully treated	98	72	33	69
Failures	2	28	67	31
Irregular discharges	(2)	(26)	(61)	(28)
Deaths	(0)	(0)	(3)	(1)
Good chronic	(0)	(2)	(3)	(2)

At the present time all patients with tuberculous pleurisy with effusion are receiving combined drug therapy for a minimum of from 6 to 8 months The immediate results of prolonged drug therapy and hospitalization are not readily apparent because the early therapeutic response is usually favorable in almost all patients treated by bed rest alone However, previous experience at this hospital has indicated that abbreviated periods of bed rest alone are inadequate because in a group of 78 patients so treated for less than 6 months, 52 5 percent had relapses and of 90 patients so treated from 6 to 12 months, 21 percent had a relapse[4]

Pulmonary tuberculosis (table 4) The importance of rest therapy continues to be stressed to the individual patient with tuberculosis but was employed solely as a definitive procedure in only 5 of 431 (1 1 percent) patients with pulmonary tuberculosis

discharged in 1952 These five patients had minimal tuberculosis but current concepts indicate that *all* patients with active tuberculosis deserve antimicrobial therapy during some phase in their management Rest and combined drug therapy usually 1 or 2 grams of streptomycin every third day combined with 12 grams of para aminosalicylic acid and/or 300 mg. of isoniazid daily was the definitive treatment in 22 8 percent of patients treated until the disease became inactive

A combination of rest drugs and temporary collapse procedures was employed in 53 6 percent of the patients Therapeutic pneumothorax and phrenemphraxis have been largely replaced by pneumoperitoneum during the past five years at this hospital and the former were employed in only 11 (2 6 percent) patients in this series Two hundred and twenty patients (51 percent) had pneumoperitoneum In retrospect it is believed that this incidence was excessive and it is anticipated that the prolonged use of drug therapy will decrease the need and indications for pneumoperitoneum considerably Pneumoperitoneum apparently contributed little to the management of patients with minimal disease or those with lesions of long duration Although it appeared to be a favorable adjunct for patients with moderately or far advanced disease the response was not dramatic and usually only slight in magnitude Its role in cavity closure or its possible value in preventing future relapse is not measured by this evaluation

Major thoracic surgical procedures were performed on 91 patients (22 5 percent) of those treated until the disease became inactive Improvements in surgical technics and drug therapy have minimized operative mortality and postoperative tuberculous complications to the extent that considerably more patients are candidates for excision of localized cavitary or caseous necrotic foci Primary thoracoplasty was employed in only 12 patients (2 7 per cent) while wedge and segmental resection or lobectomy was performed on 85 patients (19 7 percent)

3 *Deaths*

There were 35 deaths in this series of 1 184 patients an incidence of percent Five of these patients died following surgery (Major thoracic surgery was performed on 150 patients discharged in 1952 thus the surgical mortality was 3 3 percent) Two were late surgical deaths resulting from empyema secondary to decortication one was an early surgical death following pericardiectomy and two deaths immediately followed surgery attributable to a blood transfusion reaction in one instance and bronchial obstruction and atelectasis in the other Of the 30 nonoperative deaths 8 were from nontuberculous causes The causes of death in the remaining 22 patients who died from tuberculosis were as follows tuberculous meningitis 4 pulmonary insufficiency sec

ondary to tuberculosis, 4 pulmonary artery thro pulmonale, 1, silicotuberculosis, 2 massive pul rhage, 1, and progressive tuberculosis, 10 None caseous pneumonic tuberculosis Antimicrobial dru of controlling active infection to the extent that tients survive for a long time only to die of compli quelas of tuberculosis such as pulmonary insuffici monale, hemorrhage, subarachnoid block, and cer ritis

4 *Good chronic" discharges*

Twenty four patients (1 6 percent) received a type of discharge All had intermittently positive essentially asymptomatic, and could not be expecte further improvement with prolonged hospitalizatio definition of "good chronic" is difficult, but the pared by the Committee on Therapy of the American ciety gives valid reasons for maintaining this ter at present * No patient received this type of discharge he understood the contagious nature of his disease h pressed a willingness to co-operate with public health official and had living facilities suitable for proper care and isolation measures

5 *Irregular discharges*

The irregular" discharge rate of a hospital varies with local policies and criteria for discharging patients with tuberculosis The types of discharge recorded at this hospital are maximum hospital benefit (inactive or arrested by 1950 National Tubercu losis Association Standards, and "good chronic") deaths, trans fers, and administrative discharges Any other discharge is termed irregular * By these criteria, 231 patients with active tubercu losis left the hospital against medical advice This constitutes 19 5 percent of the total tuberculosis dispositions (1 184 pa tients, table 5) and 27 9 percent of the 831 patients (table 6) who were under definitive care

Tuberculosis is characterized by an inherent degree of chronic ity and necessitates prolonged periods of hospitalization This is true in spite of rapid strides in drug therapy which undoubtedly has cured more patients over shorter periods of time than pre vious therapy Many patients become restless homesick and develop extraneous problems which tend to diminish insight to the seriousness of a disease which paradoxically permits them to feel well after a brief period of therapy Throughout the year it has been our policy to minimize these problems by supplement ing the treatment program by education of the patient through u e of chaplains, medical social workers occupational therapist and appropriate recreation

From an administrative viewpoint we treat the following groups of patients military civilian dependents and veterans The different rates in the irregular discharge among the three categories is very striking (tables 5 and 6) particularly when all were treated by the same staff in the same institution It is very low in the group subject to military discipline (1 7 percent) and highest in the veteran patients (48 7 percent) who enjoy some measure of independence because of pensions The disease was less severe in the military patients and therefore the above groups are not similar for comparison The discrepancy may be minimized by selecting the 366 patients with moderately advanced disease (table 7) who were admitted for definitive therapy (administrative transfers excluded) Although the type of disease among the military patients was usually of more recent origin an analysis of dispositions by success and failure is so striking that comparisons are meaningful The over all number of patients treated successfully was 69 *percent Ninety eight percent of the military*, 72 per cent of the civilian and only 33 percent of the veteran patients were treated to the inactive stage The failures are directly related to the irregular discharge rate among the three groups of patients and indicate the seriousness of the problem of irregular discharges from tuberculosis hospitals

DISCUSSION

Most of the patients discharged in 1952 were admitted to the hospital in 1950 and 1951 and therapeutic methods applied do not necessarily represent current concepts of management This was a transitional period when almost all patients began to receive drug therapy that is patients with minimal disease and pleural effusion were no longer denied antimicrobial therapy This change has evolved with the realization that drug resistance occurs in a distinct minority of patients receiving combined drug therapy At this hospital less than 10 percent of the patients treated according to current concepts are known to harbor drug resistant organisms

This was also a transitional period with reference to duration of drug therapy Only 49 percent of the patients with pulmonary tuberculosis received more than four months of drug therapy While drug therapy was not used to its best advantage in this series it is now the policy of this hospital to administer concurrently at least two of the three major antimicrobial agents (streptomycin or dihydrostreptomycin para aminosalicylic acid and isoniazid) to all patients with active tuberculosis until the stage of arrested or inactive disease is attained Recent results suggest that this will decrease the need for temporary collapse measures The latter are now chiefly used for a cavitary lesion which has not yielded to rest and drug therapy in a person who is not a candidate for a definitive thoracic operation

It is imperative that systematic steps be taken to study the long range effects of the increased use and prolonged duration of drug therapy, excisional surgery, temporary collapse [illegible], and the need for protracted periods of strict bed rest Such [illegible] may be aided by the use of cards to record pertinent inform on discharged patients This system may point out [illegible] serve as a base line for follow up studies

Irregular discharges from tuberculosis hospitals are problem throughout the United States At this hospital cent of 1,184 patients with tuberculosis left the hospital medical advice during 1952 Many of these will not contin ment in the home, instead, they will contribute to the vast voir of persons, known and unknown, who serve to defea berculosis control program Public education as well as strengthening and enforcing of public health laws may be a portant in the over all picture of eradicating tuberculosis as the most profound advances in therapy

We believe that the punch cards described will be useful for long term follow up studies of the treatment of tuberculosis

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Medicine as it is known and taught today is largely concerned with disease in the civilized white man When the world is considered as a whole the white men are a minority group and civilized man is a recent phenomenon in history The study of little known races living in primitive environments in medically unexplored territory can be expected to reveal new manifestations of disease if not new diseases which may well prove important in the general advance of medical knowledge Further study of the differences in the incidence of appendicitis in different West Indian island populations for instance might clarify the etiology of this condition It is especially important that such work should be done now since primitive ways of life and even the people themselves are in danger of dying out

—*British Medical Jo*

THE PROBLEM OF THE HOSTILE RELATIVE

EUGENE R INWOOD *C I I MC USA*

IN a previous article the therapeutic interviewing of hostile relatives with the aim of alleviating their hostility was discussed In this paper the entire problem of the hostile relative is considered The tendency is to consider these individuals an unfortunate administrative problem and to ignore the interpersonal relationship that can be established to alleviate the situation Most psychiatrists have had some experience with this problem and have developed a way of handling it In this particular study a relevant factor was that the patients legally could not be committed to a psychiatric institution Most of the patients were in the military service and subject to military regulations which although adequate do not have the authority of a legal commitment The remainder of the patients were on a voluntary status Thus if the relative had any hostility toward the military it was likely to be displaced onto the hospital

This psychiatric problem has been treated indifferently in the literature Some references to the hostility in relatives has been made by Strecker in his discussion of mothers of service men in 1946 Other writers have touched upon the problem but have not dealt with it directly The reasons for this may be the hostile relatives themselves who have a drive to get to someone in higher authority to express their hostility Frequently these persons start at the administrative level of a hospital thus tending to avoid the clinical personnel The hostile relatives are those who persist in making unreasonable demands on hospital personnel and whose hostility and anxiety are not relieved by the usual methods of reassurance

This study includes all visiting relatives during a two year period who insisted on seeing the chief of the Neuropsychiatric Service because of hostile reactions to the hospital The term relative is used for one member of the family or for the entire family if they came together They all had one common charac

F m A my M d 1 S c G dua S h 1 W 1 R d A my Med 1 C W h g D C

teristic in that they objected strenuously to the hospital in some way Relatives who had a great deal of hostility initially but who responded to the usual explanation of the professional staff were not included in this group It was recognized that many persons could be expected to react aggressively to the mental illness of a close relative This initial reaction was not classed as hostility because a visit to the hospital was reassuring when the hostile relative obtained factual knowledge of the patient's illness, the treatment given or anticipated, the attitude of the staff, the atmosphere of the hospital, and the expectation of recovery

Although the hostile relatives showed many individual differences, they also manifested similarities which were typical of the group, such as their drive to get to a responsible administrator This drive is very similar to the reaction seen in mothers who must do everything possible for their children and encourage them to be dependent This need to be overprotective was based largely on feelings of rejection and guilt and was demonstrated in almost every situation Even when it could not be demonstrated to the satisfaction of the relative, it was nevertheless, observed by the physician

MANIFESTATIONS OF HOSTILITY

These people wanted to talk about the hospital and about what was being done by the hospital to interfere with the patient s happiness The patient's illness was generally ignored The attitude shown by this group can be expressed in a composite statement such as "give me back my baby" or "let me protect my baby" Many of these relatives believed the return to the mother figure was all that was necessary to effect a complete and permanent recovery In some of these families the patient refused to see the relative, and in others the patient accepted the visitor indifferently or sent him away In such cases the hospital was sometimes accused of poisoning the patient's mind against the family

The most frequent demand made was that the patient be released from a closed ward, which appeared unreasonable when it was made for a disturbed patient who had just told his wife to go away and that he never wanted to see her again This situation is further distorted when the wife insists that being locked up is what is making the patient ill and that she will contact her congressman to get him released

Another constant source of hostility was the Army s role in the origin of the illness Relatives demanded either full recovery or full compensation for the illness because it was considered that the Army made the patient ill Many well educated relatives,

who might have been expected to know better were very persistent For example a dentist insisted that his brother s manic depressive psychosis was due to army service even when it was clearly established that the patient had had two attacks prior to entering military service This relative wanted either complete cure with no more attacks or satisfactory monetary compensation In the discussion of the case it became evident that he felt guilty because he had been completely out of contact with the patient for several years and also because he had been embarrassed by the patient s conduct in an earlier illne s

TABLE 1 *Compl t of ho t l lat v*

C mpl t	Number
P t k pt cl d w d	53
A my d pat ll	44
D t lik h d	34
P t t d d tor t p y hiatr t	18
Ins t mm diat dis ha g	19
Ins g t k g p t t h m le	14
N t gh p v cy	14
I t o pr v te bath	9
P t d h s l thi g	9
P t t k t be d h g d	6
W t p f pat t	7
P t t m t be m d— k t y	13
P t t ha be phy lly mi t eated	6
P t t be g p d by h p tal	2
N h g be g don for pati nt	9
M lla us (po f od inad quat t ti tera)	12
T l	269

The denial by relatives that the patient had any psychiatric illness manifested itself in several ways In one instance already mentioned the relative believed the patient would be all right at home Others were insistent that the patient had some physical illness or injury Many relatives were surprised to learn that psychiatrists were physicians They refused to accept the absence of any physical illness and not infrequently insisted that the patient be examined by a medical doctor Because this had already been done it was routinely suggested that the family physician or a local physician of known ability examine the patient.

Some of the hostility was related directly to the psychosis of the patient One patient had told his relatives he was being poisoned by someone at the hospital, and they had accepted the entire delusional process In another case the delusions of a patient that he was sprayed with live steam every night were accepted by the entire family This family carried its demands to high legal and military sources to have this "mistreatment" stopped In spite of the almost overwhelming evidence they never became convinced that the spraying was delusional

In these situations the complaints themselves were not necessarily hostile It was the attitude behind the complaint the persistence in doing something to "correct" the situation and the need to go to top authorities, both military and civilian which demonstrated the hostile reactions The complaints have been tabulated (table 1) to indicate their variety

All of the complaints which were directed against the hospital were investigated even when it was obvious that they were fantastic It was a matter of policy to run down these alleged incidents, not in a punitive way, but on the basis that anyone might make a mistake This policy of getting the facts allowed for investigation without adding to the anxieties and problems of ward personnel Ironically, when a real problem came up the relatives usually were not hostile but reacted with understanding For example, two very disturbed patients impulsively became involved in a fight in which one suffered a bruise on his face His family made no outcry but accepted a simple statement as to how it had occurred

GENERAL CONSIDERATIONS

It had been observed that sometimes hostility diminished when the relative talked with a psychiatrist about the patient An analysis of these interviews indicated that when the relative expressed his feelings about the patient he frequently mentioned in some way previous negative feelings toward the patient. When he was able to understand and accept his own hostility toward the patient, his hostile feelings toward the hospital diminished As the relative became aware of these unanticipated feelings within himself he frequently discovered that he had been inconsiderate of the patient as a person Consequently, the patient then became the important focus for his attention rather than the hospital Frequently, the relative expressed guilt over his past behavior In such cases action was taken to dissipate the guilt, because a guilty reaction would be only temporary and might be followed by rationalization and more hostility

In dissipating this guilt no long or involved interpretations or explanations were made If the relative offered a seemingly reasonable explanation for his behavior it was accepted as being the best he could have done at that time For example the father of a rather passive patient expressed his disappointment over his son s repeated failures and stated he had tried to help him by very active supervision and by doing things for him and in turn expected his son to be successful He hated the son because of his repeated failures The interview began with the assertion that nothing was being done for the patient and that he the father was a man of action and expected just one of two things from the hospital either complete recovery or complete retirement benefits after a few months It was pointed out that the patient had had some trouble for a long time and that he must have caused considerable difficulty to his father in growing up The father replied He was always a disappointment to me He has failed at everything" He revealed in considerable detail how he had repeatedly intervened to help his son but it had never worked out He eventually raised the question of whether or not he had been making a mistake in trying to help the boy The explanation was given that his son had resented this supervision and had kept on trying only because of his love for his father The father became aware of his interference in his son s life and was eager to co-operate He saw that he had made his son dependent on him and that this dependence had caused hostility toward the father The father left the interview to discuss with the son how he could help him to become independent Son and father went on to work out a satisfactory relationship which was mutually helpful and contributed materially to the recovery of the patient

INTERVIEWING TECHNIC

The relative was encouraged to describe his feelings toward the patient The interviews developed a pattern which was flexible but covered certain pertinent information in each case For instance the relative was given complete freedom to discuss any matter at the beginning of the first interview After a few minutes the patient s name would be brought into the conversation The relative was then asked about the patient and was guided gently into a discussion of how he felt about the patient. Inquiry of the relative s reactions to the patient while growing up brought out his feelings toward the patient In many cases it was the first time that the relative had ever thought of himself in his role as parent wife or sibling With many relatives this was enough they were annoyed at the way they had pictured themselves and were willing to do what they could to modify their behavior Finally the relative was asked to come back for another meeting

Once the relative had expressed some negative feeling about the patient, this feeling was accepted He was immediately reassured that it was all right to have that kind o feelin and to express it This was directed toward modifyi e attitude of the relative and allowed him to feel that he wa ceptive friendly hospital

With the overprotective, dominating mothers was rarely reached in one or two interviews Th ested only in telling the story of what they had they had sacrificed On the other hand, there group, who having made their complaints appeared to be functioning on an all or none b of these groups of mothers, attention was so on their requests that a positive affirmation wa they could accept or actually recognize Becau the requests could not be granted, it was help some form of compromise In order to avoid struggle, some suggestion could frequently be would satisfy the relative's need to assert him at the same time, benefit the patient This ofte relative to feel accepted and to co-operate by s of his feelings about the patient

RESULTS OF INTERVIEWING

From July 1950 through June 1952, 112 hostile re interviewed (table 2) Of these 112, 91 were inter hours or less and 21 were interviewed more than two three or more interviews Although the period of obser of the relatives was short, and was limited to scattered a week or less in most cases and not over a period of six months in any case, 82 of the first group of 91 gained some knowledge of their interpersonal relation with the patient and were able to use it in establishing a more sound relationship for the future and were able to respond with co-operation and understanding Nine of the 91 were not benefited by the inter views Six of these were unaware of the problems as they existed, they reacted only to the fact that a loved one was being held in the hospital, which they believed was, in some way deeply harmful to him They demanded that the patient be discharged at once and refused to accept any other answer It was impossible to establish any kind of rapport with them Some of them accepted the delusions of the patient as real and others refused to admit that the patient had any illness Attempts were made to obtain further interviews with three of these but without success The remaining three relatives appeared to be satisfied with the entire situation and no hostility came out in any interview but all were dissatisfied that the patient had not

made a complete recovery They had discussed the future treatment of the patient co-operatively and in one case enthusiastically However their belief that the hospital had done a poor job was passed on through correspondence or in person to high military authority One of these letters was written a full year after the patient was discharged This group may be larger because dissatisfaction does not always come to light when it is indirectly disseminated

TABLE 2 *H t l l t terv ew d*

P gr	I terv w d 2 h ur l	I terv w d m th 2 h urs	T tal t w d
M rk d mp v m nt	82	0	82
Sl ght mpro m t	0	15	15
N mp me t	9	6	15
T t l	91	21	112

I lud hr wh ff fted h l ty direc ly b w or ta d h gh th u

In the group of 21 relatives six remained as hostile as ever Of these six only one appeared to be without some definite emotional disturbance Of the other five three showed some paranoid tendencies and two had passive aggressive personalities Because no progress was made with these individuals in the first few interviews and as they had no real desire for interviews they were considered as unchanged The diagnostic impression made in five relatives was supported in every instance by material from other sources such as the patient the social history and opinionated observations from other relatives

In two of these paranoid situations the entire family accepted the patient s statements and delusions completely One psychotic patient had the delusion that he had been court-martialed and was *in jail He had been in difficulty for going AWOL but was* transferred to the hospital as soon as his psychotic condition was recognized The family saw no evidence of any mental illness To them the patient was in jail because he was on a closed ward After several months he improved and remembered his actual experiences but was unable to recall the delusional trial he had been talking about for many weeks At this point the family accused the hospital of drugging the patient to make him deny the trial He was discharged to his own care and the family still not convinced of his illness

Fifteen relatives were interviewed at length as frequently as could be arranged, and some understanding of their personality structures was obtained (The total time devoted to each varied from 10 to 84 hours)

Five relatives in this group were overprotective five had established lifetime patterns of anticipating the and desires of the patients This type of personality been described at length elsewhere,[2] but an example of the characteristic behavior is worth reporting Because military patients have been away from home for a long time usual procedure is for relatives to come to visit the it and perhaps stay a week, however, three relatives nately dropped everything they were doing and came to One of these, the older sister of a paranoid patient, moved Washington and was at the hospital every day for several s When her brother was to be transferred to another hospital insisted on visiting several hospitals before she found hat was acceptable to her She assumed her role in these rds "It's my fault in a way I encouraged him to come in the Army Now that you have done this to him, the least I can is devote my life to looking after him " It had become her mission in life to annoy and harass the people who were trying to aid her brother She was seen for 30 interviews, with no change in her attitude She repeatedly insisted on sneaking matches to her brother in a disturbed ward She was warned, and then not permitted to visit for a few days Consequently, she ceased this dangerous practice

One individual in this group was the rather typical "hen pecked husband " He came to the office, repeated his demands in a hesitant way, and was very tense In view of this, he was asked about his family He spent an hour praising his wife and her ability as a mother It was suggested that she come to the next interview, but she did not appear She never visited the hospital and yet was directing her husband in a campaign for which he was ill suited He was continually demanding that the patient a 24 year-old schizophrenic, be immediately discharged The patient had asked that he be kept in the hospital a few more weeks so that he could be discharged to his own care rather than return to his family

This was explained to the father, who was agreeable at first but became quite anxious within a few minutes He left several times to make a telephone call Finally, with encouragement he was able to state that he felt this would be best for the boy but didn't know what he would tell his wife about the matter knowing that the boy resented her Finally, after considerable length and finally he decided to tell his wife that he

told what was going to happen and had been given no opportunity to dispute it

He revealed that his wife had always been very sure of herself and had managed things He concluded with the statement that he would be glad to see the boy get away from home for a fresh start Because the patient s mother never came to the hospital for an interview and as she dealt quite harshly with the father when he failed in obtaining her demands it was assumed that this was her way of exercising her authority over her husband and that she had little if any real feeling for her son

In working with these hostile persons one fact was very evident Relatives of psychotic patients tend to deny their hostile feelings toward the patient in his prepsychotic life This hostility in many instances is completely outside the awareness of the relative In other situations the relative is aware of his feelings to some degree All of the hostile relatives attempted to compensate for their hostility in some well-defined pattern of overprotection projection withdrawal or denial Once this displaced hostility (toward the hospital) could be recognized by the relative it could in most cases be traced back to the patient Then when it could be seen in perspective it could be dealt with by relatives who were mature enough to do so The others found it unacceptable

In an effort to determine if some of the more difficult relatives could be aided by intensive prolonged psychotherapy several were seen at length One wife was seen for a total of 84 hours of interviewing because although very hostile at first she showed some slight tendency to understand herself As her husband was a chronic patient who could be expected to live out his life in a hospital, a prolonged effort was made to treat her with psychotherapy

CASE REPORT

This 54 year-old woman was the wife of an officer who several days before admission had attempted suicide by shooting himself in the right temple performing a right lobotomy and a partial left lobotomy He had been making an uneventful recovery in the station hospital at his duty station but had been transferred because of his wife s insistence and because she was a problem to the hospital personnel

This became evident within a few minutes after the patient was admitted to this hospital She announced that she wanted a cot brought to the room immediately because she would need it that night to sleep on When informed that she could not remain on the ward overnight she insisted on seeing the chief

of service the first thing in the morning At that [illegible] made many demands on the hospital When these [illegible] could not be met, she announced that she would [illegible] rander of the hospital and that we would hear from [illegible] man and some high ranking officers she knew She [illegible] after that but learned that if she were going to [illegible] for her husband it would have to be approved by [illegible] Because she had a great deal of anxiety and [illegible] permitted to come to his room and feed him [illegible] hours The patient at first made rapid progress and [illegible] weeks he was ambulatory and talking and joking [illegible] patients He was mentally clear for present event [illegible] remember shooting himself The suggestion was [illegible] wife that she should establish a home to which she [illegible] the patient as he would soon be ready for convale[illegible] The wife was permitted at her request to break the [illegible] husband The next morning, he had a generalized [illegible] was unconscious for several minutes He developed a hypostatic pneumonitis and was transferred to the Medical Service of the hospital While there, he refused to move his right hand and leg Neurologic examination findings were normal A stormy convalescence followed He was mentally and physically inert for several weeks but finally improved somewhat and was able to be up in a wheel chair The wife was very unhappy about the situation with the Medical Service From time to time she had requested consultations for various conditions which she believed her husband to have, and she said these consultations were not done Usually the resident on the service would make an examination and find nothing She insisted that her husband was being neglected During this period she was being interviewed two or three times a week At times the interviews were stormy because she insisted on seeking outside influence to force the hospital to treat her husband as she wished him treated

Finally she was told she could see her husband only during visiting hours She was encouraged by the therapist to accept this to see if her husband would improve without her She was seen daily during this period Her husband improved again and made enough progress in a few weeks to again consider sending him home The matter was mentioned to him rather than to his wife but it had the same effect Within a matter of hours he had another seizure and a relapse without any apparent cause other than the stress of the thought of returning home When he again improved, he was retired from the military service and transferred to another hospital The wife remained in contact and was seen in several interviews since then

In interviews this woman was unwilling to speak very much about herself The first several interviews were merely tirades against the hospital accompanied by hints and threats of her military and political influence and what she would do to see that her husband received what she considered proper care Finally she was persuaded to talk about herself She was very much alone and had more problems than she could po sibly solve She was an only child who had been raised in the traditions of the Old South " She had been engaged to be married and without warning had been abandoned She acted as though she were the one who had broken the engagement. She had married her husband after a short courtship but she was still in love with her first fiancé She then proceeded to plan her husband s career He must reach the top She never missed an opportunity to do whatever she believed necessary to help her husband to advance He possessed a great deal of ability but had no great drive to get to the top Although he never admitted it he apparently had no real urge to be a general officer The wife on the other hand was motivated in order to justify her marriage All went well as long as he received routine promotions and became a colonel However when he did not receive any higher promotions and seemed content, the wife experienced a great deal of anxiety She would talk openly of how her husband was not being treated fairly and of how de serving he was Her efforts to make people aware of this ap parently were offensive Finally in a period of depression after it had become apparent to him and to everyone else ex cept his wife that he was not going to be promoted he shot

(1) At first the wife had no idea that she might have offended anyone or that her husband could have wanted anything different for himself than she did Eventually she came to see things more as they were This came about in part because of the way in which she reported experiences with her daughter The daugh ter had been an only child and had been brought up with every privilege but on a very strict schedule Consequently she grew up with very ambivalent feelings about her mother When the daughter married the mother made frequent visits and tried to run both households The daughter developed a way of be coming ill during these visits The son in law was interviewed and verified this He thought his mother in law had never matured and always had her own way He believed that she needed psychiatric treatment and he wanted an overseas assignment because she had a disturbing effect on his family

She had so much hostility toward the hospital that she had to ventilate it and these interviews were her only method of release As she learned that she was welcome to ventilate

she gradually talked more about herself and less about the hospital She eventually saw that her efforts to help her husband by threats and similar measures were unsuccessful This was followed by an insincere overcompensation phase in which she praised everyone and gave presents to those concerned with her husband because she was still trying indirectly to manage his treatment One day she said, "It seems no matter what I do, I offend people" The answer was confirmative At this point, she left the office but phoned the next day for an appointment At the interview, she raised the question as to why she behaved as she did She stated that in her way she had been trying to help her husband and had not really meant to offend It was pointed out that she had been extremely critical of some very able physicians and had acted as though she knew more than they did, and that this must mean she thought they were incompetent She denied that and again angrily left the office However, she returned in a day or two agreeing that the psychiatrist was right and she was wrong However at once she started another maneuver to get the psychiatrist to intercede with the medical service for an unnecessary consultation The inconsistency of this was explained

Her method of operation was one of declaring herself to be helpless and then appealing for help She was looking for someone to take over all of her problems and work them out as she herself wanted them solved Because this was an impossible approach, it did not work She did, however, manage to learn a little about herself At one time her husband was believed to be dying and she was almost elated as she reported this The observation that she seemed happy about it took her by surprise, but she rallied and denied it Later she admitted it and rationalized it on the basis that death would be better for him because if he lived it would have to be in one of "those terrible institutions" for the rest of his life When she left the hospital after having been seen 84 times in interviews she was exactly as she had been all along as far as her personality was concerned

Although no definite diagnosis was made in this woman's case it was observed that she was a passive-dependent-aggressive person with marked immaturity This case has been discussed at length because it has demonstrated that prolonged work with this type of person is usually not effective She continued treatment in order to attempt manipulation of the hospital staff When this was not effective she continued because she had nowhere else to go Therapeutically work with this woman must be regarded as a failure

SUMMARY AND CONCLUSIONS

In March of 1952 the matter of therapy on a brief basis with hostile relatives was discussed at length with the neuropsychiatric staff The value of talking about himself and how he felt about the patient was explained and numerous examples were given The entire staff responded with interest and accepted these principles for dealing with hostile relatives In the following months the number of hostile relatives referred to the chief of service had fallen to one a month whereas before the staff started this type of work it had averaged about two per week None of the relatives seen in this last part of the series could be helped by interviewing They were without exception persons whose emotional disturbance was so deep that it was impossible for them to be aided by brief psychotherapy

This demonstrated that the interviewing need not be done by any particular individual but that this important interaction could take place between any trained psychiatrist and the relative What really was effective in the interview was the realization on the part of the relative that he was hostile toward the patient When this could be seen most relatives were willing to reorient themselves and take the necessary action to modify their relationship with the patient. Many times this was accomplished in a few interviews with a psychiatrist If results were not favorable after a few interviews prolonged psychotherapy was necessary although the results sometimes were discouraging

It was observed many times that the modification of the relative s attitude created a new type of relationship for the patient and his family This was of great assistance in treating the patient and enabled several patients to achieve real independence which had never before been possible Thus this type of interviewing appears to be of value as it favorably influences the prognosis of the illness

In the cases in which the true meaning of the hostility toward the hospital was not revealed to the relative no change in attitude occurred and the treatment was not as effective In this situation it may be speculated that the patient unconsciously chose to remain in a hospital rather than return home where he was not loved

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Wound Healing

How many of us stop to think why it is that an open wound almost invariably remains free from infection even when it is grossly contaminated? The reason is that the body fluids blood and serum flush the wound of dead and necrotic material and at the same time make the environment undesirable for bacteria It is only during this initial or exudative stage of wound healing that infection occurs Sutures placed in a wound at this time prevent the flushing action of these tissue juices and encourages the production of bacteria During the last war the medical advisors to the Armed Forces who undoubtedly were men of vast surgical experience issued a general order that all wounds should be left open until they could be properly repaired Thousands of young lives were saved because of this order

Because of modern refinements in technic and anesthesia and because men are taken at an early age and trained in the art of surgery each succeeding generation of surgeons is better in all phases of surgery These surgeons know the role the antibiotics play in prevention of infection but they also know that the living cell is still the greatest barrier to infection They have the same respect for the single living cell as they have for the entire mechanism be it asleep or awake They know that unnecessary injury to one cell might be followed by death of the entire part

—PHILIP A CAULFIELD M D and
HOWARD S MADIGAN M D
in American Journal of Surgery

Control of Diabetes

The individual who escapes smallpox diphtheria and typhoid deserves no credit because his good fortune is largely due to governmental health regulations This does not hold for diabetes because freedom from it in those hereditarily predisposed depends to some extent on the individual's avoidance of that contributory factor—overweight The control of diabetes is dependent on a rigid regimen of diet exercise and insulin—morning noon and night—all the length of one's days

—ELLIOTT P JOSLIN M D
in Postgraduate Medicine

ACUTE ANXIETY REACTION VERSUS "BLAST CONCUSSION"

CHARLES S MULLIN J *C mm nd MC USN*

MANY men develop varying degrees of confusion and anx iety following exposure to an unexpected nearby ex plosion in combat Some become ineffective and develop headache dizziness areas of amnesia startle reaction and persisting anxiety following withdrawal from the danger situation There may be secondary anxiety control symptoms of an hysterical nature established immediately or within a few hours or days This is the familiar shell shock of World War I

In World War II and in I orea, this syndrome has been widely and somewhat compulsively referred to as blast concussion implying a disturbance of brain function directly due to blast effect.

One hundred and fifteen marines in whom this condition had been diagno ed by battalion and regimental medical officers were transferred to a forward medical company in my care during a two-month period of the Korean campaign Following their eval uation only 10 of the group were regarded as representing probabl cases of blast concussion (cerebral) The others were believed to be suffering from the effects of an acute traumatic neu rosis Since returning to the United States, I have observed several hospitalized patients with this syndrome who were treated with the assumption that their symptoms were the result of the continuing effect of brain injury

The problem is important because of the temptation to evacuate these casualties rather than treat them forthwith as acute anxiety reactions with a fair to good return to duty potential It is important after their evacuation to rear hospitals because of the undesirability from the point of view of both doctor and patient of treating a man with a neurosis as one with brain trauma

EVIDFNCE AGAINST BLAST CONCUSSION

It appears that the tendency of many medical officers in the field to regard this condition as representing a blast concussion is encouraged by the presence of such symptoms as pressure head sensations or headaches transient tinnitu dizziness

F m U S N I H p tal N nal N I M d I Ce Md Comdr Mull now t U S N I H p l Oc d Cal f

following possible bodily injury from an explosion The work of Simons and Wolff[1] suggests that the commonest form of headache following head injury is extracranial in origin, caused by a sustained contraction of scalp musculature related to emotion and/or to stimuli arising from areas of extracranial soft tissue damage The comparative frequency with which these headaches are associated with areas of tenderness about the scalp and with stiffness of the neck suggests that those "outside the skull" factors may be important in the genesis of this particular symptom In several of this group of so-called blast concussion cases procaine was injected into the scalp musculature at points of local tenderness, and every patient obtained partial or total relief of the headache, at least temporarily

The history of many of these patients indicated that after the blast was experienced, they recalled being thrown or physically shaken It is possible that many patients sustained an external injury of the head and neck The initial "dizzy" sensations are not true vertigo Simons and Wolff believe this symptom is, in most cases, of extracranial origin

These manifestations do not appear to reflect the essential pathologic condition The typical picture also included tremulousness, all the psychologic evidences of anxiety such as tachycardia, dilated pupils, and increased respiratory rate, and feelings of physical and emotional depletion, combined with a pervasive apprehensiveness, startability, and preoccupation These manifestations are considered basic but were often associated with varying degrees of dissociation of consciousness, patent hysterical symptoms, amblyopia paralysis mutism, rigidities, hyperventilation with varying degrees of tetany, infantile regressive phenomena, and amnesia for personal identification

Other considerations tend to focus attention on the overwhelming influence of emotion in the production of this syndrome at the expense of the assumption that an external "physical," cerebral insult is the primary cause Extreme degrees of preoccupation and dissociated states of consciousness are sometimes seen, the total dullness of apprehension of the environment the orientation (in the absence of dissociation) characteristic of confusion after head injury, is not common The patient may appear to be entirely out of contact with his surrounding but remain keenly alert to any sound remotely suggestive of danger

CLINICAL OBSERVATIONS

Retrograde amnesia was rare In the majority of patients there was some recollection of the moment of impact, the sound of the explosion, the "flash the sensation of the blast," the feeling of dirt and debris against the body and of being physically shaken or thrown Transient dazing" or confusion was invariable Cl

ev dence that unconsciousness followed the explosion was lack ı in the great majority of instances, although patchy amnesic l ı unıe and blackouts minutes to hours after the precipitating vent (often in evident connection with a scene of carnage revealed when the man had begun to collect himself) were fairly cor r or Often however the patient gave a fairly clear account of ev ry thing that had happened to him

Bl Jing from the orifices was uncommon Mild epistaxis oc- r d in about 10 percent of the entire group External bleeding y th ear was seen in only 3 of the 115 cases Perforation r e tympanic membrane was observed in 8 cases Injection of the tympani was more common but in most cases the drums were normal In two patients with perforated ear drums, probably due to blast who had not been admitted for psychiatric treatment significant anxiety v as absent and their complaints were in reference to their ears A cursory neurologic examination was ne ative in all patients ( ) who were believed to have an acute anxiety reaction alth nystagmus was tested for in only a bout a third of t ı

The fe mplained of pain in the chest or ab domen ve muscular strains and bruises rather than ra abdominal injuries Three patients stated ıp (not coughed) blood streaked sputum bı t d r e of hemoptysis One patient claimed to but there were no other findings to in ntra abdominal organs and another reported he t lood by rectum but was found to have large bleed- e l If the postulated brain injury were due to the l ı t one should expect to find more evidence of horacic or intra abdominal organs which would rab e to blest effect than an organ enclosed in

I PESERVICE TRAUMA

In most ca es (but by no means all) the patient s history prior to entering the service revealed that his psychologic adjustment had not been wholly satisfactory A history of frequent, mild to moderate headaches nervousness or intimations of emotional im aturity prior to enlistment was common The more obvious was the evidence of preservice instability the more serious and enduring were the manifestations of the syndrome Furthermore the physical and/or psychologic *condition of the men* in this group at the time of the injury irrespective of the preservice personality was apt to be adverse in one way or another There may have been evidence of increasing and unwonted combat anx iety for days or months before the incident close buddies had been killed or wounded and the recollection was still poignant

A prolonged and severe fatigue state or a current debilitating gastrointestinal infection might be present Sometimes there had been recent disappointment in rotational expectancies with consequent impairment of motivation and personal morale (this was very common), certain important supporting figures in the group had become casualties, or various extramilitary worries were present All these observations would have more validity if a controlled interrogation of wounded in action admissions without an obvious neuropsychiatric component had been set up, but they are at least suggestive in the light of the other evidence

Finally, it is probably significant that this traumatic syndrome is rarely seen in officers—at least not to a degree requiring admission to the hospital Over a six month period, only one officer with this condition out of about 180 bearing the diagnosis of blast concussion was admitted The ratio of officers to men in the actual combat area was about 1 to 30 It seems fair to assume that the combat officer is more stable" in the sense that he is apt to be more resistant to anxiety or better able to control it than the average enlisted man, by virtue of his more rigorous selection, and that there is some relationship between this relatively greater stability and his negligible liability to the syndrome

DISCUSSION

On the basis of the foregoing observations it appears that this is a condition which, in its essence, bears a closer relationship to neurosis than to cerebral trauma It seems likely, as has been pointed out by others, that in the initial phase the condition represents a direct "primitive" overaction of complex stress response mechanisms to sudden "dangerous" excitation The hysterical, dissociative, "pseudopsychotic," and regressive phenomena seen in the earliest stages are considered secondary manifestations of "instinctive" anxiety defensive operations It is believed that many of the later, and perhaps overshadowing symptomatic and behavioral manifestations, occurring after days, months, or years are related to previous, pretraumatic conflicts and needs respecting hostility, dependence, guilt, self realization, or sexual adjustment that have been revived and maintained because of the enhanced psychologic vulnerability to the original trauma

The question as to why some are seriously affected and others escape this disabling response to sudden threat can be answered only in the most general terms The evidence suggests first, that men who develop this condition seem less "well adjusted" that the more obvious the psychologic "weakness," the more severe and persisting the illness and second, that the syndrome is more apt to occur when adverse conditions are present *e g* physical exhaustion, loosening of group identification death of a buddy or prolonged combat experience

SUMMARY

Of 115 consecutive patients bearing a diagnosis of blast concussion (cerebral) admitted to a forward medical company in Korea 105 appeared to be suffering mainly from a form of acute anxiety The evidence presented indicates that this acute syndrome resulting from exposure to a nearby explosion is usually best understood as a psychologic reaction to overwhelming threat rather than as the primary consequence of brain injury

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Fear vs Anxiety

Let us differentiate fear from anxiety Fear is the emotional response to recognized external danger and is accompanied by physiologic changes Anxiety is the emotional response to partly or wholly unrecognized internal danger and is often accompanied by physiologic changes Fear and its accompanying physiologic alterations constitute reaction designed to meet the external threat

—HENRY P LAUGHLIN M D
in Medical Annals of the District of Columbia

War Neuroses

The fundamental basic pillar of the neuroses in war are based on the drive for self preservation with its affective aspect fear of death and on the residue of the Oedipus complex present in all in varying degree particularly the sense of guilt deriving from a fantasied murder in the past Every adult has within him the precipitates of the Oedipus complex of infantile sexuality and hence has a certain neurotic potentiality which varies with the individual These are basic facts Given these combat may provoke symptoms of the psychoneurosis called war neurosis In view of the fundamental nature of the fear of death present in all and the consideration pointing out its neurotic structure it is obvious that combat fatigue is totally misleading that operational fatigue is equally so that traumatic and war neuroses are closer descriptions of the syndrome However I wonder if the neurosis is not more cogently expressed in the term death anxiety neurosis which while not a pleasant term is nonetheless more completely descriptive and accurate than any of the others

—JOSEPH D TEICHER M D
the Journal of Nervous and Mental Disease

A CHILD GUIDANCE CLINIC IN AN ARMY HOSPITAL

ERNEST K MONTAGUE *Major MSC USA*

WILLIAM W THOMPSON *Major MC USA*

THIS article is a résumé of the first four and one half years of the functioning and practices of the child guidance clinic at Brooke Army Hospital

Scheibel et al [1] stressed four factors leading to the establishment of such a clinic (1) Family stresses involving military personnel directly and adversely affecting the morale and efficiency of the individual and his functioning in his unit, (2) constantly recurring problems noted in the neuropsychiatric outpatient clinic involving children but without adequate personnel and technics available for their treatment, (3) the recurrence of pediatric problems involving emotional and interpersonal stresses which the pediatric staff believed needed more specific evaluation and treatment and (4) the existence in the area of several large Air Force and Army bases served by this hospital

In addition to the foregoing, other important factors played a vital part in the establishment and enhancement of the child guidance clinic The clinic provides opportunities for essential training and experience of clinical psychologists, psychiatric social workers, psychiatrists, and other medical personnel in community relationships and child psychology The standard operating procedure of the clinic crystallizes the team concept in the use of the varied disciplines in medical and supporting services

Four years of child guidance practice has borne out the need for and desirability of having such a clinic in this location Using only two half days of clinic time per week and with a limited staff, the clinic has handled nearly 700 referrals, these referrals coming from an ever widening geographic area This figure represents only the number of cases referred When one considers that each case involves two to four members of the

From Brooke Army Hospital Fort Sam Houston T M J Major is now with Reed Army Hospital Washington D C

family unit two things become obvious The clinic has actually treated from 1 500 to 1 800 persons and it is in strict reality a *family* guidance clinic

CHILD-FAMILY SOCIAL RELATIONSHIP

The importance of this latter concept and its place in the philosophy of the clinic cannot be overemphasized It is a fundamental tenet of child guidance practice that the child and his problems cannot be isolated from the sociofamilial matrix in which he operates No child is reared in a vacuum Physical factors basic and learned drives social learning and awarene s learned habit patterns organic illnesses and the reaction thereto parental attitudes school pressures in group demands and financial and social restrictions strongly influence the unique patterning of each child s reactions to the demands of life

While in many cases a child s behavior and motivations may be altered by treatment directed solely at him treatment will usually be more economical and enduring if it includes not only the child but also his interrelationships with his family and other intimate environmental units Of these the family is the most important and most accessible to treatment The primary orientation of the clinic has been toward the problem *situation* rather than toward the problem *child* This general philosophy is implicit in the remainder of our discussion

ORGANIZATIONAL AND FUNCTIONAL RELATIONSHIPS

Available during the two half-days of clinic time each week are one or more psychiatrists neurologists pediatricians psychologists psychiatric social workers speech pathologists and a capable secretary and receptionist The services of the electroencephalographic and other laboratories head specialties clinic the physical medicine and cerebral palsy clinic and other hospital facilities are available when needed The physical needs of the child guidance clinic consist primarily of office space a play therapy room equipped with a one way vision mirror and sound equipment and sufficient toys and play material for diagnostic and therapeutic sessions

Both structural and functional aspects of the clinic might best be clarified by following a case through it Thus a mother having been requested by a school teacher to bring her child to the clinic will first talk to the secretary who obtains a brief family history and arranges an appointment with the psychiatric social worker At the first interview a full explanation of clinic procedure is given and the parents willingness to participate is determined At this appointment the mother without the child is given time to describe the problem to give some of the fundamental family problems underlying and related to the chief com

plaint, and to give her reactions to it The nur
devoted to this varies from one to three After t
decision is made as to the applicability of cl
the particular case Once accepted appointment
the pediatrician, psychologist, and psychiatri
psychologic examinations of the child (includ
evaluation, appraisal of personality dynamic
achievement testing) are completed The psychia
views the child and one or both of the parents p
to important areas indicated in other interviews

Perhaps the most important single meeting of
weekly staff conference, then takes place Here
present their findings and recommendations Dy
underlying the problem are brought to a focus, fu
tion is discussed, and therapy aims and method
At this meeting the specific plan or disposition is dec d on
Here the child may be referred to other agencies for further diag
nostic work or taken on for treatment It may also be decided that
the parent represents a clear psychiatric problem which could
best be handled by the neuropsychiatric clinic The personnel to
be used in treatment depend on the goals decided upon in con
ference Goals vary tremendously Infantile speech in a seven
year old child may take a few hours of the speech therapist s
time with a social worker concurrently working through some of
the dynamics with the parent or parents, and the problem resolved
in few sessions Again, a withdrawn young adolescent taking
refuge in daily fantasy episodes, with marked school and social
difficulties, may require a relatively intensive course of treat
ment covering many months More frequent are the cases of
healthy children rebelling against the restrictions and demands of
unyielding parents in which the treatment emphasis must be
placed almost entirely on the parents

Assignment of patients to staff personnel is a matter of some
importance and interest The number of workers with training and
experience in dealing with the problems of children and parents
is, in the Army situation a potent variable In many clinics the
social workers deal with the parents, and the psychologists and
psychiatrists are occupied with the children It is important in
view of the frequent transfer of staff personnel to train and use
each staff member in direct relation to his current experience and
ability The psychiatrist as the co-ordinator and director of
treatment activities, not only sees patients himself but main
tains general supervision All treatment cases are reviewed peri
odically in staff conference and decisions as to further treat
ment or disposition are made there

THERAPY VARIES

The specific techniques used in child guidance therapy vary with the type of patient the skills of the staff and the philosophy of the clinic Many clinics with a strong psychoanalytic orientation may give intensive and prolonged treatment to a relatively small number of cases Our policy with a large shifting clientele and small staff is to select patients who will benefit from a relatively short term of therapy seldom more than 15 or 20 sessions Techniques include the usual forms of short term therapy interviews such as supportive interpretive, nondirective directive and group therapy the aim being to bring about insight and remedial behavior on the part of the parents or children The aim of play therapy is to allow catharsis, to redirect unacceptable activities to infer dynamics, to bring about a better child-adult relationship and frequently to allow the younger child to work through some of his problems in a symbolic form just as the older child and adult may work through his problems employing the symbolism of language As necessary various group techniques have been used, that is parent groups (after duty hours) play groups remedial reading and speech therapy groups

CIVILIAN AND MILITARY CO-OPERATION

The work has resulted in a variety of co-operative alliances with civilian and military agencies A strong work relationship has been developed with the administrative and guidance officials of local schools enrolling dependents of military personnel Similarly there has been close co-ordination between the child guidance clinic and the juvenile courts, the Children's Service Bureau and other welfare agencies in the handling of problems involving military dependents

Rapport and co ordination on a larger scale between civilian and military have been enhanced considerably by the consistent and enthusiastic participation of staff personnel in a variety of educational activities Staff members have given many talks and *participated in panels and seminars before church parent*, teacher and other organized groups on a municipal county and state basis Parent study groups in the field of mental hygiene and parental guidance have been conducted for military personnel stationed in and near San Antonio Within the military structure the clinic has filled a real need as evidenced by the ever increasing requests for consultation from practically every major Army Air Force, and Navy installation in the Fourth Army Area

From the inception of the clinic in August 1948 to 1 January 1953 670 families had been referred for diagnostic and therapeutic work As of the latter date, 630 of these cases had been closed leaving 40 in varying stages of preparation and *treat-*

ment The closed cases include "cures," all degrees of relief from symptoms, and families who moved from the area because of exigencies of the service

REFERRAL DATA

Table 1 shows the increasing use of the clinic by various referral agencies Certain trends can be noted The first five months of operation (1948) saw 84 percent of referrals coming from the pediatric clinic, other services of this hospital, and from the parents involved

This was primarily the result of local publicity and the marked interest of the pediatric service The following year (1949), with continuing publicity to parents in Parent Teacher Association groups, et cetera, brought an increase in parental referrals, a consequent decrease in pediatric referrals, and a greater use of our facilities by other intrahospital services The next three years brought about a general referral increase from the geographic area served The apparent decrease in parent referrals is partly accounted for by the increase in school referrals With good school liaison, parent referrals entered the clinic sooner than they would have of their own volition The passage of state legislation providing guidance workers in the school systems may also have increased the number of cases referred from schools

REASONS FOR REFERRAL

Table 2 presents the primary complaints of the parents upon entry into the clinic It must be stressed that the symptom upon which the parents have focused does not necessarily reflect the actual state of affairs in the family constellation Many families present multiple problems which, for the most part, may be interrelated in cause, for example, a frequent combination is school difficulty, enuresis, and aggressive behavior The parents may seize upon one of these as of primary importance, and disregard the others Thus, many parents will be extremely concerned about school difficulties but consider enuresis only an annoyance Others may be reluctant to present enuresis as an initial problem because of the stigma attached to it even though it quickly turns out to be a prime reason for them to seek aid Although enuresis accounts for only 5 percent of the initial complaints, its frequency as a symptom is much greater

Similarly, the categories of aggressive behavior and school problems present tremendous overlap in practice The designation of initial complaint is often a matter of whether it was instigated by the parent or teacher The age of the child is also a factor in whether or not the case is categorized as a behavior problem Frequently there is overlap between

TABLE 1 S / / m l by y

R f g ge cy	1948		1949		1950		1951		1952		T l	
	N m- b	P	N m- b g	P r-	N m b	P t	N m- b	P	N m b	P	Num b	P
P d l	44	55	61	38	50	34	41	27	45	34	241	36
P t	16	20	48	30	65	45	47	31	25	19	201	30
O h t f B k A my ll p l	7	9	29	18	16	11	30	20	10	7	92	14
S hool	2	2	4	3	3	2	6	4	13	10	28	4
O ly g ba nd m p l g p	11	14	17	11	12	8	28	18	40	30	108	16
T l	80		159		146		152		133		670	

TABLE 2 *Initial complaints*

	Number	Percent
Aggressive behavior (includes anti social behavior)	155	23
School problems (scholastic and be ha ior)	151	23
Emotional problems (nervousness fear fulness and withdrawal)	66	10
Speech problems	63	9
Mental retard tion	51	8
Enuresis	35	5
Intellectual evaluation	32	5
Cerebral palsy and muscular defects	27	4
Psychosomatic problems (dermatitis colitis gastric ulcers vomiting asthma chronic recurrent illness hypochondriacal reaction hyper tension)	20	3
Convulsive problems	19	3
Evaluation for adoption or foster home placement	13	2
Adolescent delinquency	6	-
Evaluation of blind and deaf for placement	6	-
Gross parent l maltreatment	6	-
Gross sexual problems	5	-
Feeding problems	5	-
Habit reactions (tics etc)	5	-
Vocational guidance	5	-
Total	670	

school problems, and aggressive reaction to school and home pressures Speech problems usually demonstrate one or more additional areas of difficulty in adjustment.

Some explanation is necessary concerning the absence of withdrawal and shyness as a separate category in our table Actually a few of the cases listed under the heading of emotional problems are cases of marked withdrawal Unfortunately the quiet and withdrawn child has a less irritant effect upon his teachers and parents and often is reinforced in his mode by being praised as a model of deportment, despite the belief that many withdrawn children are prone to serious behavior difficulties in later life

This state of affairs is gradually improving particularly among teachers as mental health knowledge is more widely stressed in the school curriculum

Psychosomatic problems referred from the pediatric clinic were from a small but interesting group of patients, and psychologic treatment of the parents and child was successful to a fair degree

Evaluation of young patients at the cerebral palsy clinic often included a referral to the child guidance clinic for intellectual and speech evaluation and therapy for the child and for aid to the parents in adjusting to their particular family situation

In discussing table 2 it was noted that the initial parental complaint may not reflect the prime problem in the family situation The focus of attention by the parents on the child s reactions is to be expected and this makes it easier for the parents to seek guidance Frequently the first two or three sessions change the emphasis of the problem considerably In some cases this may be a gradual realization by the parents of their own problems In other cases the parents may be well aware of their own difficulties and will directly or indirectly state that their problems with the child gave them an avenue to obtain help for themselves Sixty five percent of the treatment sessions are spent with the parents To demonstrate the often tenuous relation between original complaint and the final impression a series of 10 consecutive summarized cases is presented These reports are only descriptive and do not reflect the dynamic formulations on which treatment was based

CASE REPORTS

Case 1 This eight-year-old boy was referred by the school principal because of grossly maladjusted behavior in school manifested by lack of co-operation extreme aggressiveness toward other children and poor scholastic work The mother s countercomplaint was that the school was discriminating against her child and other children were always picking on him To support this the mother had surreptitiously taken pictures of playground activities By frequent letters containing these photographs she approached the local school authority the county superintendent of schools and eventually the state board of education Physical examination of the boy was within normal limits but psychologic examination indicated low borderline intelligence Psychiatric and psychologic work up of the mother showed a grossly demanding and controlling mother and wife and findings indicative of early paranoid schizophrenia Stormy sessions with the mother ensued at weekly intervals for a period of three months, during which time she insisted upon the integrity

of her child and herself and persisted in her belief that [illegible] was at fault. No work was attempted with the child. After of three months the mother withdrew from treatment, still gained no insight into her child's difficulties, and still demands exceeding his abilities. Brief consultation a year at the husband's request, revealed that the mother had sought aid of a civilian psychiatrist, was better accepting her son limitations, and was seeking special schooling for him.

Case 2. This 12 year old boy was referred by the Red Cross because he was inattentive and uncooperative at home and in school, was barely passing, had committed minor thefts, was enuretic, and was generally "out of hand." Physical examination was within normal limits. He had normal intelligence but showed considerable hostility toward male figures. Interviews with the mother revealed that her husband was overseas, she and her children were living with a strict and rigid brother in law who discriminated against her children, and she had taken a full time job outside the home. She showed marked dependence on the sister with whom they lived. After two months some insight was gained, and the mother moved into a home of her own, quit her job, and devoted more time to her children. The boy's behavior improved considerably, family tensions were lessened, the mother expressed more confidence, and the case was closed.

Case 3. A 13 year old girl was brought to the clinic by her mother, who complained that the girl was withdrawn and unhappy at school, "but is a perfect bully at home and browbeats everyone, including her mother." The mother compared her very unfavorably with her other daughter and had threatened the girl several times with institutionalization.

Physical examination revealed an obese, but otherwise normal girl. Laboratory studies failed to show any cause for her obesity. Miller psychologic tests indicated a superior intelligence, but much emotional lability, strong feelings of inadequacy, and sibling rivalry.

Interviews with the mother brought out the presence of long-standing and severe tension between the parents, and pointed up the strong dependency needs of the mother unsatisfied by her rather immature husband. During fourteen sessions some insight was gained, the mother's rejection of her daughter was somewhat reduced, and intrafamilial relationships were improved. Eight interviews with the daughter verified her deep feelings of inadequacy in social and school situations and re-emphasized her feeling of hostility toward her mother. At the closing of the case, the mother was complaining less about her daughter but was not completely satisfied. The daughter had improved to a greater extent. She had accepted invitations to school [illegible]

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the first time and had actually enjoyed one Although this case was closed comparatively soon considering the depth of the mother s feelings it was felt that optimum benefits from short-term therapy had been obtained and that gradual improvement would continue

Case 4 A nine-year old girl was referred by the school principal because of her lying, stealing swearing and grossly aggressive behavior She had attended four schools during her first three school years, being removed from each because of her behavior

Physical examination was normal She was highly imaginative extremely hyperactive and had average normal intelligence The examination protocols indicated much hostility toward the mother and a desire for more attention from the father At a staff conference the decision was made to attempt very brief directive interviews emphasizing home management and the possibility of changing schools again the following school year Shortly thereafter as the end of the school year approached the mother desired to terminate the interviews stating that there was much improvement in the child s behavior The fallacy of the approach employed was made evident by the return of the mother at the beginning of the next school year complaining that the child s symptoms had only been intensified Interviews with the mother were begun again play therapy with the child was instituted and she was transferred to a different teacher The procedure was cut short by the family s departure for overseas and the case was closed as unimproved

Case 5 This 10 year old girl was referred to the clinic by her mother because of frequent headaches and stomach aches For the previous five years the girl had had petit mal attacks which were controlled for the last two years by phenobarbital She had no behavioral difficulties at school No organic basis was found for the somatic complaints She had low average intelligence A series of supportive sessions with the mother indicated sibling rivalry a long term tendency of the child to use illness as a means of controlling her mother and considerable inconsistency in punishment by the parents complicated by the presence of a maternal grandmother in the home contradicting many of the parents disciplinary measures The mother was well aware of the use of illness from the beginning but was uncertain as to how to handle it in view of the past diagnosis of epilepsy During eight sessions she was given support in developing a consistent disciplinary pattern in dividing her time equitably between her children and in developing satisfactory technics in dealing with her own mother After a trial period of six weeks a final interview showed considerable gain in consistency of at

titude toward the children and a definite belief on the part of the mother that the family situation had reached a point where she could continue with confidence The original somatic complaints had practically ceased It was agreed that she should mal e con tact with the clinic if she felt the need for help No further con tact has been made

Case 6 A six year old boy was referred by the pediatric clinic with a history of birth injury, convulsions, and retarded develop ment The family had been previously informed that the child was retarded and found some difficulty in accepting this informa tion Nevertheless, they were interested in obtaining psychologic evaluation of their child and advice regarding school placement Examination of the boy revealed physical co ordination at the five year level and dull normal intelligence Interviews with the father revealed definite interparental inconsistency in treatment and attitudes concerning the child The mother was over protec tive, whereas the father overtly pushed the child beyond his capabilities involving strenuous athletic training in an effort to make him the physical and mental equal of his younger brother and voiced impatience with the child s tendency toward with drawal The father was resistant to clinic procedures and after the initial interviews made various excuses to cancel further appointments He made a single contact with the clinic seven months later, showing slight concern over the negativism of the child, who was now in the same grade as his younger brother The father had accepted in part the findings of the clinic but he was unable to verbalize the factors involved in not pushing this child excessively His insight was superficial and his pri mary motives in returning to the clinic were to show the efficacy of his modification of the staff's recommendations and to secure further reassurance, which was given to his satisfaction

Case 7 This five-year old boy was referred from the pediatric clinic, where he was under treatment with cortisone for rheuma toid arthritis, with this comment. "Emotional aspects of the dis ease seem to be overwhelming the physical aspects and much of his difficulty lies with the emotional problem of the parents His physical examination revealed typical early rheumatoid ar thritis and he would break out with a rash whenever severely disturbed Psychologic evaluation revealed normal average in telligence The parents were expecting adult behavior from him and could not appreciate his present behavior as part of his nor mal developmental pattern The mother projected her anxiety, insecurity, and conflicts on to the child Supportive sessions with the parents, who gained some superficial insight, resulted in rapid remission of the child s physical signs and symptoms The father then went overseas, and the child had an exacerba tion of all complaints, spent most of his time in bed crying and

the child had difficulty in peer relationships but was generally accepted and liked by adults Both parents revealed rigid and unbending attitudes, expressed, for example, in their extreme concern over her unwillingness to conform to their schedule for piano practice The parents felt that many persons with whom they dealt were undisciplined and lax in their attitudes, and had resolved that their children should learn self discipline "through constant demands and requirements from without" As the interviews continued, the parents developed considerable insight into the meaning of their demands on the child, became much less critical and more accepting, and finally became very appreciative of the child's talents and of common child parent interests The night episodes had ceased to be a problem and the case was closed improved

Case 10 This nine-year old girl was referred by the pediatric clinic with a history of recurrent attacks of nausea and vomiting since age four During the year prior to referral, there had been three prolonged episodes requiring hospitalization and parenteral fluids An appendectomy had been performed four months prior to admission, only to be followed by another prolonged attack of vomiting The girl was markedly dehydrated, lethargic, and unresponsive to questioning After fluid and electrolyte balance was restored, psychologic examinations revealed her to be of very superior intelligence, striving for independence, and sensitive to impaired interpersonal relationships at home, particularly those stemming from the presence of the paternal grandmother The child had adopted a considerable amount of the mother's worry over her husband, who had been in a combat zone, and was much aware of the mother's feeling of inadequacy in managing the home situation Interviews with the mother pointed up rivalry between mother and child in personal appearance, a situation made less tenable for the child by her broken front teeth The mother was aided in working through some of her own feelings of inadequacy, in establishing residence separate from the grandmother, and in developing better rapport with the child Dental repairs were accomplished for the child The case was closed as the mother demonstrated more self confidence

SUMMARY

A child guidance clinic was established at Brooke Army Hospital in 1949 The aims, principles and rationale set forth by those who were instrumental in establishing and developing the clinic have been substantiated Few changes have been necessary The services rendered by the clinic have contributed materially to the morale and efficiency of the military personnel who have used these facilities The hypothesis that family troubles reduce a worker's efficiency is well known in indus tri

While the loss of efficiency in military surroundings is difficult to measure other than by casual observation we can assume that improved adjustment on the part of the soldier father in his family relationships improves his other relationships The benefits accruing from the close teamwork of a group were gratifying

REFERENCE

1 Sche b l A B Zeh F A d Chamb R E E bl hme t f h ld guida l Army g l h p l *Bull U S Army M. D pt* 9 449-457 Jun 1949

How to Write Badly

Some papers may be too short lengthen them by explaining things that do not need explaining

The card nal s n f poor writing is to b concise and simple A cloud of wo d may co ceal defects in ob rvation or analysis Examples

Bible Render to Caesar the things that are Caesar s

Poo In the case of Caesar it might well be considered appro priate from a moral or ethical poi t of view to ender to th t potentate all of those go ds and m ter als of whate er cha acter or qual ity which c n be shown to h ve had their original sour e in any p rtion of the doma n of the latter

Conc se The d tes of s eral ob ervati ns are in doubt

Po It should be mentioned th t n the cas of se eral observa tions the e is room for considerable doubt concerning the correct n of the dates on which they were m de

rite hurriedly prefer bly when tired Have o pl n The articl will thus be pont n ous nd poor

—PAUL W MERRILL
S t / M thly 64 72 1917

One i fortunate to practice medic ne in a community where his fellow phys c ns how respect for one another and abstain from open criticism or even ins nuat ns ga nst fellow practit oners The doctor who stoop to cr ticize or cast uspicion on a fellow physician cheapens him lf sually mor than he damage the accu ed Unfortunately he hurts the entire profess o for he undermin s the confidence of a patient in the sk ll nd nteg rity of his per onal physic an

—ALFRED E CHADWICK M D
n th *P nnsylvan a M dical Jour al*

THE MANAGEMENT OF ERYTHROBLASTOSIS FETALIS IN A NAVAL HOSPITAL

MILTON KURZROK *Commander MC USN*
FREDERICK B BECKER *Lieutenant MC USN*
FRANCIES MARSHALL *Lieutenant, MC USN*

THE purpose of this article is to present a program for the management of the problems related to maternal Rh factor and fetal maternal blood group incompatibility that we hope can be used in all military hospitals engaged in obstetric and pediatric care

PRENATAL PHASE

When the expectant mother first registers at the prenatal clinic, in addition to other routine laboratory procedures, a specimen is drawn for blood grouping and Rh factor determination Experience has shown that it is wise to repeat these tests, even though the patient has had similar work done elsewhere Our results have been at variance with those obtained at other hospitals in many instances, especially with reference to the Rh factor

Patients who are found to be Rh negative are given an appointment for a regularly scheduled clinic day, when a member of the pediatric department presents the essential problems of Rh factor incompatibility The subject is handled in such a way as to be readily understood by our patients, many of whom have a misconception of the problem We consider that these discussions are an essential part of the program

Rh antibody titers are checked as follows Primigravidas who have never been given a blood transfusion have a specimen drawn for titer at about the thirty second week of gestation If sensitization is demonstrated, follow up determinations are done at each subsequent clinic visit. All other patients are checked on the second visit and again at the thirty second week if the original test was negative If Rh sensitivity is discovered specimens are collected at each visit. A list of the names of all sensitized patients is kept on the nursery

From U S Naval Hospital Chelsea Mass

bulletin board and the pediatric department is notified of the admission of any Rh negative patients The list of sensitized patients is checked with each new admission, and suitable preparations are made at this time In this way, the possibility of overlooking a potential erythroblastotic infant is minimized

Every effort is directed toward having the patient deliver at term No deliveries are induced or cesarean sections performed simply because of the probability of erythroblastosis However, some investigators consider that evidence of fetal distress occurring late in the third trimester in certain sensitized women may constitute an indication for either the induction of labor or a cesarean section [2]

NATAL PHASE

Special precautions are taken to avoid anoxia in infants born of sensitized Rh negative patients The mother receives oxygen by inhalation throughout the second stage of labor sedative drugs are restricted to a minimum, and delivery is usually accomplished under regional anesthesia with 1 percent procaine

If it is fairly certain that we shall be dealing with a severely ill infant the cord is clamped early because there is evidence to suggest that the 100 to 125 cc of blood from the placenta may overload the circulation in a sick baby The cord is cut at least two inches from the skin margin and a saline dressing is applied to keep it moist. A specimen of cord blood is obtained for grouping Rh factor determination and Coombs testing [3]

A pediatrician attends the delivery when there is evidence of fetal distress during labor or labor is premature and also if a cesarean section is performed or erythroblastosis in the infant seems likely

POSTNATAL PHASE

All infants born of sensitized Rh negative mothers are examined immediately by a pediatrician especially for edema jaundice and hepatosplenomegaly If any of these clinical findings are present or if the Coombs test is positive a complete blood count is done and repeated in accordance with the orders of the pediatrician who is on guard for an existing or developing anemia and is concerned with the relative number of immature red blood cells If immediate treatment is not indicated the infant s color is observed and recorded at 30-minute intervals for a period of 24 hours At the first suspicion of pallor or icterus the pediatrician is summoned

THE ROLE OF THE LABORATORY

On this department devolves the work of performing the various indicated procedures After routine testing for blood groups all

Rh negative specimens are tested, using Diamond slide test. All blood specimens which give a suspicious reaction are rechecked, using the indirect Coombs test This relatively simple method of mass screening may be criticized because of the admitted advantages of the trypsin and plasma albumin methods, however, the shortage of trained laboratory personnel has precluded the use of these technics in our hospital The slide test is simple and quick, and accurate when properly performed and interpreted To our knowledge, we have never obtained a false negative reaction

It is also the responsibility of the laboratory to insure that the pediatrician is notified of the detection of all sensitized patients and to prepare a written report for insertion in each patient's record

FACTORS IN EXCHANGE TRANSFUSION

Factors in determining the advisability of exchange transfusion are

1 Evaluation of serum bilirubin by the micro method is ideal, but many hospitals are not equipped for this procedure

2 Maternal Rh antibody titer of 1 64 or higher [4] [7] An Rh positive, Coombs positive baby of a mother with a titer of 1 16 is considered a likely candidate, [7] but transfusion is withheld until the first signs of erythroblastosis appear

3 Anemia at birth [7]

4 Size of the liver and spleen [4] Any newborn infant having an enlarged liver and/or spleen should be suspected of having anemia The enlargement is usually in direct proportion to the degree of anemia

5 Previous history [4] [7] If the infant is found to be Rh positive and if there is a history of a previous erythroblastotic offspring, either stillborn or liveborn an exchange transfusion will probably be needed

6 The appearance of early jaundice within the first 24 hours of life Sepsis must be ruled out if the onset of jaundice is in the first 24 hours

7 Progressively deepening jaundice and increasing anemia following an initial exchange transfusion are indications for a second or a third exchange transfusion

PREPARATION FOR EXCHANGE TRANSFUSION

When the decision is made that an exchange transfusion is necessary the mother and if possible the father are informed of the existing condition their written permission is obtained,

the laboratory is notified Because of the need for oxygen tion good light and a surgically clean environment, we do ll our transfusions in the operating room

The infant is taken to the operating room in a warm incubator and oxygen is administered during the trip Any standard type inf nt bassinette which can be kept warm may be used for the in f nt during the transfusion Suction by means of automatic pump bber bulb or mucus trap and catheter should be available brea hing oxygen should also be on hand from a central supply arge tank or anesthesia machine

One unit of 500 cc of blood is needed [1] Type O Rh negative blood is used with 10 cc of Witebsky[14] substance added although Diamond prefers low titer O negative female blood We use blood from the American Red Cross blood donor center If it is more than 4 days old we obtain a donor from among duty personnel i hospital In connection with the con troversial indicatio blood from female donors it is of interest to note th f our donors were by chance males

EQUIPMENT REQUIRED

The spec ecessary for an exchange transfusion costs a t be obtained from any medical supply house t of two 20 cc Luer Lok syringes (stock No 80- 10(Services Catalog of Medical Materiel) two way to LI /S Becton Dickinson Co Catalog) a Tuoh adapter reboted with 49 gage drill (C R Bard Co, 90 Morris Ave Summit N J) 1 umbilical vein cannula (Becton Dickin on) and one 38 cm length of 18 gage poly ethylene tubing (No A9590 and A2591 Clay Adams Co Cata log)

Other necessary equipn ent usually included in the standard supplies of any operating room consists of a recipient trans fusion set umbilical tape a metal tray for convenience of packing and storing the sterile set one 10-cc Luer Lok syrin e 2 pieces of rubber tubing (one 6 inches long, the other 36 inches long), straight scissors a 15-cm stainless steel ruler, mos quito hemostats 2 Monel metal basins needles (No 18 19 20 and 24 gage) 4 towel clips 6 or more hand towels 9 half sheets gauze sponges plain tipped and toothed forceps and a blunt metal probe

ASSEMBLY OF APPARATUS

Figures 1 and 2 illustrate the method of assembling the special equipment At time of operation 200 cc of sterile saline and 1

Ed tor s N t A mpl ppa u d t th U S N l Ho p tal B th d Md m t th la d f th t p k It propo t d th t t l h h f l t g

cc of 1 100 heparin solution are added to each of the Monel metal basins The polyethylene tubing is rinsed inside and out with this saline solution and inspected to make certain that both ends are square and smooth Prior to inserting the tubing through the cannula, the rubber washer should be inspected for patency, because if the threaded end of the cannula is screwed down tight during sterilization, the rubber washer will become soft and the lumen will be narrowed If the lumen cannot be

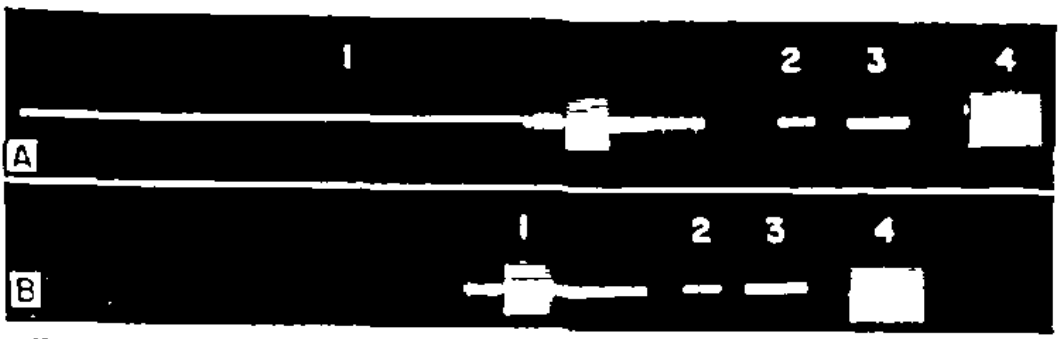


Figure 1 (A) Umbilical vein cannula (1) cannula (2) rubber washer (3) metal collar and (4) knurled end (B) Tuohy adapter (1) Luer Lok end (2) rubber washer (3) metal collar and (4) knurled end.

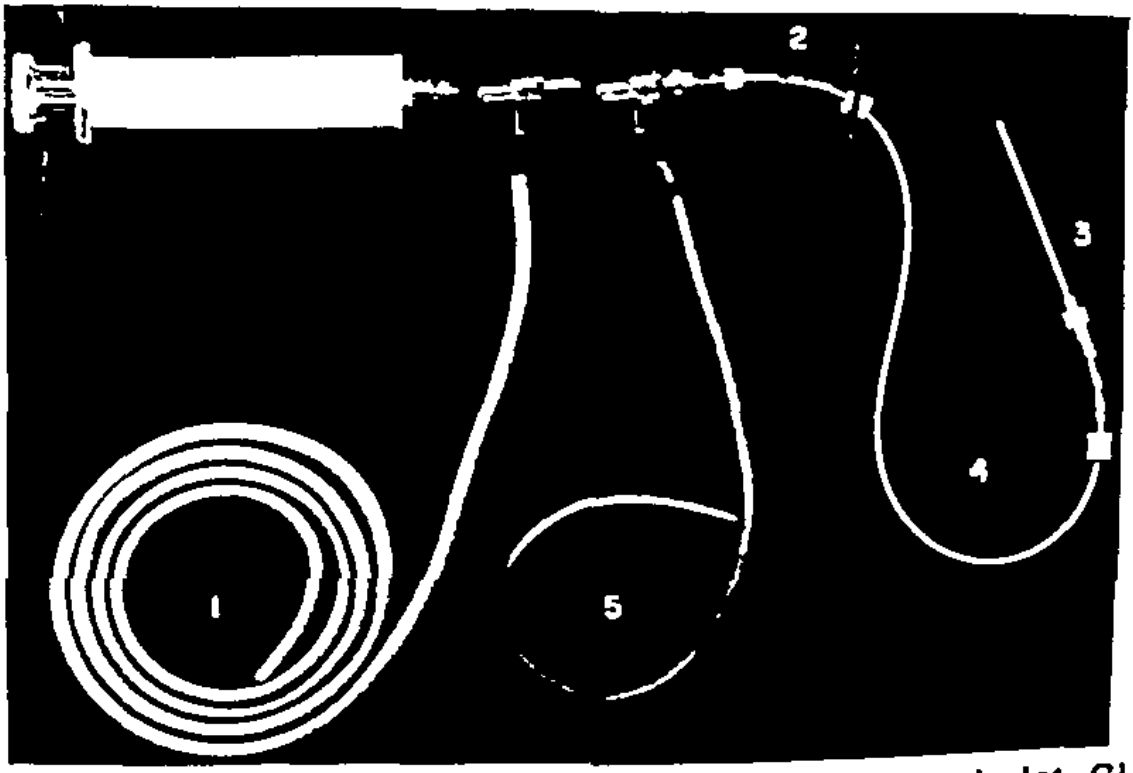


Figure 2 Transfusion set (exploded view). (1) tubing to waste bucket (2) Tuohy adapter (3) umbilical vein cannula (4) polyethylene tubing and (5) blood intake tubing

opened by passing a probe through it a new washer must be inserted The plastic tubing should protrude about 0 3 cm from the end of the cannula and be fixed by just enough tightening

the threaded end so that it will not come out if pulled The other end is inserted through the Tuohy adapter with approximately 0 3 cm of the tubing protruding The two 3 way stopcocks are joined and attached to the Tuohy adapter with the polyethylene tubing protruding slightly from the lumen to help prevent clotting of blood The 6 inch piece of rubber tubing is attached to the stopcock nearest the Tuohy adapter the other end is connected with the blood from the recipient set The 36 inch piece of rubber tubing is attached to the second stopcock and the free end dropped into a waste bucket The entire system of plastic tubing is then filled with saline solution

TECHNIC OF TRANSFUSION

After preparation of the patient the cord is cut off square about 1 cm from the skin margin If it is completely dried out it may be cut off flush with the skin The umbilical vein is identified The arteries two in number are thicker walled and protrude slightly on cut section and rarely bleed while the umbilical vein is thinner walled has a larger lumen and frequently bleeds The cannula is then inserted into the cut end of the umbilical vein In order to avoid pushing a blood clot ahead of the cannula it is inserted about 2 5 cm and gentle suction is continuously maintained while it is withdrawn It is then gently reinserted as far as it will go The progress of the cannula is usually stopped after it has entered about 2 5 cm at the int where the vein passes through the peritoneal reflection hen this happens slight caudad traction is applied to the cord and the cannula is alternately withdrawn and pushed forward until the forward course of the vein is located and cannuliza tion can continue When blood appears in the plastic tubing and can be withdrawn easily the cannula is fixed in position

At this point the Tuohy adapter can be detached from the 3-way stopcock and held so that the plastic tubing is perpendicular to the abdomen in order to measure the venous pressure with the ruler Normally this is 6 to 7 cm The adapter is then reconnected to the stopcock

The technic involves alternate withdrawal and replacement of blood A working deficit is usually maintained 20 cc being the minimum In general the sicker the baby, the higher the venous pressure and the greater the deficit one should use Blood may be exchanged in any volume according to the patient s condition In the more acutely ill infants it is probably exchange blood in smaller increments The maximum i should not exceed 20 cc In order to facilitate the wi of blood it may be necessary to put gentle traction on stump by pulling caudally on the tie around it Sometime also necessary to advance or withdraw the cannula slightl

procedure is continued until a total of one unit (500 cc) of blood is used Frequent shaking of the donor bottle is advised to prevent settling At the end of the transfusion, the deficit is replaced[11] and, depending on the condition of the baby, an additional 20 to 30 cc may be given

One 20-cc syringe is used at a time for both withdrawing and injecting blood During the transfusion, it will be found that the syringe being used will become sticky and difficult to manipulate By rinsing it in saline heparin solution, it can be restored to normal working ease

USE OF CALCIUM GLUCONATE

During the exchange, a portion of the patient's ionized calcium is bound by the excess citrate in the donor blood[9 11] and the infant becomes irritable and develops a tachycardia It is therefore recommended that a 10 cc syringe, filled with 10 percent calcium gluconate, be available One cc of this solution may then be injected slowly into the umbilical vein catheter, either when the above signs appear, or routinely after each 100 cc of blood are exchanged Because calcium gluconate may cause coagulation, it is necessary to irrigate the plastic tubing with the saline heparin solution both before and after the administration of calcium During the injection of calcium gluconate, a constant check on the pulse rate should be maintained in order to avoid the development of marked bradycardia

At the completion of the exchange, the infant is given 4 to 5 cc of calcium gluconate[10] and 1 ampule of vitamin K intravenously The cannula is then withdrawn and the cord vessels occluded by tightening and securing the tape with a square knot. A moist saline dressing is applied to the cord stump and continued until the possibility of a second exchange has passed. During the transfusion, an assistant should be available to aspirate the pharynx if necessary, administer oxygen through a cone or mask if needed, check the pulse, and be scorekeeper The score sheet, illustrating a 5-cc deficit, is given below

Time	In		Out		Medication
	Amount	Total	Amount	Total	
1400 begun			10	10	
1402	5	5			
1403			20	30	
1407	20	25			
1409			0	50	
1412	0	45			

The infant is returned to the nursery in the incubator Postoperatively 30 mg of sulfadiazine sodium per pound per 24 hours is given subcutaneously in divided doses every 8 hours and 100 000 units of penicillin are given once daily This medication is continued for 3 to 5 days according to the condition of the patient and the appearance of evidence of infection The infant must be carefully observed for progressive anemia, jaundice and increasing bilirubinemia,[1] indicating the need for a second or third transfusion Evidence of tetany due to the binding of the blood calcium with the citrate of the transfused blood may develop If this occurs the patient should be given calcium gluconate intravenously The infant is fed according to the routine for its weight and period of gestation The full term baby is usually discharged with the mother Premature infants are discharged when their weights reach 5 pounds 8 ounces

CLINICAL TRIAL

Fourteen exchange transfusions for erythroblastosis were performed between October 1951 and January 1953 The only death was that of a severely affected infant who died after 115 cc had been exchanged The remainder were discharged from the hospital without any evidence of residual defects In cases blood from group O Rh negative males was used

SUMMARY AND CONCLUSIONS

The co-operative effort of the obstetrical, pediatric, and laboratory departments are essential for the effective management of erythroblastosis fetalis but it is the responsibility of the attending pediatrician The institution of the program is the responsibility of any hospital handling obstetrical patients By the adoption of such a plan improved obstetrical care can be given the prospective mother and better care of her infant is possible

Large numbers of patients can be screened by the laboratory, without the services of highly trained and skilled technicians by using a simple slide test which has proved to be rapid and accurate

The equipment recommended for use in the treatment of erythroblastotic infant is easily procured and relatively expensive The described technic of replacement has the advantage of ease and comparative safety

All large military hospitals should be prepared to do ment transfusions on their patients

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Army Hospital Personnel to Wear Identification Badges

Military and civilian personnel who attend patients in army hospitals will be required to wear identification badges of dark russet leather according to an Army Medical Service administrative letter dated 10 September 1953 It is believed that when a patient can identify by name those who are entrusted with his care he feels more secure This practice is in connection with new procedures for preparation of the patient's bed card both steps being taken better to develop confidence between patient and hospital personnel

MASS TREATMENT OF ENDAMOEBA HISTOLYTICA CARRIERS

MUNEO YOKOGAWA *M D*
DALE E WYKOFF *F t L t na t MSC USA*
LAWRENCE S RITCHIE *Ph D*

IT is generally believed that about 10 percent of the Japanese harbor *Endamoeba histolytica* Most persons with such infections are asymptomatic and some question has been raised as to the value of treating them Nevertheless most investigators believe that they should also be treated to lower the incidence of the disease

From families in the villages of Mutsusawa and Tatomi Yamanashi Prefecture Japan 241 persons harboring protozoa were selected for treatment Diagnosis was based on five fecal examinations (formalin ether concentration technic) per person Each person was interviewed prior to treatment and his symptoms if any were noted Those who were senile, under the care of a cian or who had albumin and/or urobilinogen in the urine excluded from the study Carbarsone was administered the first week and chiniofon the second week Dosage is shown in Table 1

TABLE 1

Age group (years)	Carbarsone (first week)	Chiniofon (second week)
3 6	0 25 gram daily	0 25 gram twice daily
7 11	0 25 gram daily	0 50 gram twice daily
12 or over	0 25 gram twice daily	0 75 gram twice daily

Every three days the patients were interviewed and their symptoms and side reactions to the drug if any noted Those who for some reason had not taken the drug were eliminated from the study Five weeks and again seven months after treatment each

From the 406th Medical General Laboratory U S Army Far East Japan Submitted for publication by the Director *Medical Bulletin of the U S Army Far East* 1 1 pp 124 125 June 1953
Dr Yokogawa was formerly Chief of the Department of Parasitology National Institute of Public Health Tokyo now with Shionogi Research Laboratory Osaka Japan

patient had five stool examinations Of 124 patients infected with *E histolytica* 18 (15 percent) were excluded either because of inadequate therapy or incomplete follow up Of the remaining 106, only one was still infected five weeks after treatment A survey seven months after treatment showed four (3 8 percent) with *E histolytica*

This treatment failure rate is indicative of a high level of therapy efficiency It is possible that, because of the small stature of the Japanese, the dosage of drugs may have been comparatively large However, comparable results were reported with carbarsone and diodoquin (diiodohydroxyquinoline) for persons infected during the Mantetsu epidemic [2]

An evaluation of results in relation to the benefit of mass treatment can best be done by comparing the September findings with the pretreatment findings The incidence of *E histolytica* in Mutsusawa village was 28 8 percent in January and 4 1 percent in September The latter figure includes treatment failures, in adequate dosages and reinfections The corresponding figures for Tatomi were 13 5 and 2 2 percent Ultimate benefits from mass treatment will depend on how quickly reinfections occur

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Cardiac Arrest—the Greatest Surgical Emergency

Cardiac arrest is a major surgical catastrophe which may occur at any time in an apparently normal patient undergoing even a simple operative procedure It is ominous terrifying and occurs without warning There is no greater surgical emergency Fortunately it is of infrequent occurrence but is an emergency of the utmost importance to the operating surgeon Whether there has been a marked increase in this condition in the past few years or whether the surgical profession has become more aware of its existence is a debated point Delay in recognizing this condition and in instituting proper treatment immediately means death of the patient Accordingly it behooves the operating team consisting of the surgeon the assistant and perhaps most important the anesthetist to be constantly aware of this condition

— H HANNINGTON M D
Journal of the Kansas State Medical Society

HEMOLYTIC ANEMIA COMPLICATING INFECTIOUS MONONUCLEOSIS

Report of Three Cases

MELVIN L SAMUELS *C pta USAF (MC)*

ACUTE symptomatic hemolytic anemia has been reported in association with such infectious diseases as syphilis tuberculosis atypical pneumonia, salmonellosis and streptococcal and staphylococcal infections [1-] The association of this complication with infectious mononucleosis was first suggested by report of a case by Dameshek in which additional factors of sulfonamide medication and cold hemagglutinins were present Subsequently additional isolated cases have been reported in the literature [7- 1]

In a series of 62 cases of infectious mononucleosis in a 1[9] month period ending 30 May 1953 three cases of complicating acute hemolytic anemia were observed The Coombs tests the trypsinized erythrocyte procedure were done Albumin saline titrations for agglutinins and hemolysins were not

Case Reports

Case 1 A 20-year old airman second class was well until one eek before admission when he developed headache anorexia easy fatigability, backache and low grade fever He was een on sick call and was given aspirin aureomycin and a cough mixture He returned to sick call several days later feeling ill and complaining of vomiting Jaundice was noted and th patient was then admitted to the hospital with the diagno of hepatitis

The patient was well developed and well nourished but peared acutely ill Marked jaundice was present and urticarial lesions were scattered over the chest and ab Temperature was 99 2 F pulse 92 and blood p 124/80 Anterior and posterior cervical adenopathy was and minimal axillary and inguinal adenopathy were The live and spleen were not palpable

F m U S. A For H p I FEAMCOM A Ba H hu, J pa
ow B ylor U y H p I D II T

Laboratory studies revealed a leukocyte count of 8,600 with 57 percent neutrophils and 43 percent lymphocytes, most of which were atypical monocytoid forms Hemoglobin was 9 grams, the erythrocyte count was 2,300,000, and polychromatophils and spherocytes were present The urine was plus four for bilirubin, and urobilinogen was present in a dilution of 1 1,025 Total serum bilirubin was 37 04 mg with 18 52 direct reacting Cephalin cholesterol flocculation was plus four, thymol turbidity, 11 units alkaline phosphatase, 9 6 Bodansky units, and pro thrombin time, 95 percent The heterophil antibody titer was positive in a dilution of 1 7,168 Cardiolipin flocculation was positive in a titer of 1 4 Direct and indirect Coombs' tests were positive, and trypsinized erythrocyte cell preparation was negative Bone marrow examination revealed marked erythroid hyperplasia (E M ratio, 3 1) reticulocytes were 15 percent

The patient had elevations in temperature to 105 F , poor appetite, and occasional vomiting Infusions of dextrose in saline were necessary to combat dehydration, and benadryl and ephedrine were administered because of his urticaria On the tenth hospital day hemoglobin was 7 5 grams, and a trans fusion of 500 cc of blood was given On the twenty first hos pital day total serum bilirubin was 2 28 mg with 0 80 direct reacting hemoglobin, 12 grams, hematocrit, 35 units, hetero- phil antibody titer was 1 1,792, direct and indirect Coombs tests re positive cardiolipin flocculation was negative At the six weeks the patient was discharged with a negative hete tibody titer and Coombs test hemoglobin level bein with 4,000,000 erythrocytes Liver function studi at this time

Cas \ dlot was admitted with a history of dark urin t t aundice of one day duration, and fever, chill s of two-day duration

Physical mination revealed a thin, ill appearing man with mild jaundi His temperature was 100 2 I , blood pressure, 100/70 a l pulse, 98 His pharynx was dusky, and lymphoid tissue over the posterior pharyngeal wall was hyperplastic Axillary inguinal and anterior and posterior cervical nodes were enlarged and tender The liver was palpable one finger breadth below the costal margin and was tender

Laboratory findings on admission were a leukocyte count of 15,000 with 40 percent neutrophils and 60 percent lymphocytes most of which showed variability and were of the atypical form hemoglobin 14 5 grams, erythrocyte count, 4 200 000 total serum bilirubin, 1 02 mg with 1 66 direct reacting The initial heterophil (unabsorbed) titer was 1 7, and two days later 1 14

serologic findings were negative cephalin cholesterol flocculation plus four and thymol turbidity, 6 units

Penicillin (300 000 units b i d) warm saline irrigations to throat and aspirin were started and after several days the patient felt considerably better During the second week of hospitalization the jaundice was progressively more intense and a repeat serum bilirubin showed a total of 10 74 mg with 4 50 direct reacting Leukocyte count was 18 000 with 60 percent polymorphonucleocytes and 40 percent lymphocytes, most of which again were of the atypical variety hemoglobin 11 grams erythrocyte count 3,000 000 Spherocytes were noted in the peripheral smear and the reticulocyte count was 12 percent. Direct and indirect Coombs tests and trypsinized erythrocyte study were negative Three days later hemoglobin was found to be 8 grams with 2 900 000 erythrocytes Repeat serologic studies were negative Bone marrow examination revealed erythroid hyperplasia (E M ratio 1 1) A four-day fecal urobilinogen determination averaged 210 mg per day The hemolytic index daily fecal urobilinogen (average of four days) was 46 mg The heterophil antibody titer at the tenth day of illness was 1 224 and thereafter was present in titers below 1 11[9]

After three weeks of illness the patient s hemoglobin and erythrocyte count began to rise and at the end of the seventh week hemoglobin was 12 5 grams with 3 800 000 erythrocytes Transfusion was not given The patient was discharged after ten weeks of hospitalization

Case 3 A 19 year old Negro airman third class, was well until five days prior to admission when he developed frontal cadache weakness anorexia fever and chills Urine had been noted to be darker than normal for two days prior to admission t stools were of normal color

On admission he was in no particular distress and did not ppear ill Temperature was 99 F blood pressure 110/80 nd pulse 90 The significant findings were slight scleral terus mild pharyngeal injection minimal cervical and axillary lenopathy and tenderness in the left upper abdominal quadrant. e spleen was palpable and the liver was not enlarged

nitial laboratory studies disclosed a leukocyte count of 14 00 with 30 percent polymorphonucleocytes and 70 percent atypical lymphocytes hemoglobin 14 grams 3 900 000 erythrocyte count total serum bilirubin 5 40 mg with 2 38 mg direct reacting cephal n cholesterol flocculation, plus four thymol turbidity 11 units heterophil antibody titer 1 896 Sickle cell preparation was negative

On the fifth hospital day scleral icterus was intense and total serum bilirubin was 17 94 mg with 6 23 mg direct reacting Hemoglobin had fallen to 10 grams, and erythrocyte count was 2,600,000 Bone marrow examination revealed erythroid hyperplasia (E M ratio, 2 1), and the reticulocyte count was 14 percent. The direct and indirect Coombs' tests were negative, and the trypsinized erythrocyte preparation was positive Spherocytes were seen in the peripheral smear On the seventh hospital day hemoglobin had fallen to 8 5 grams and the erythrocyte count was 2,000,000 and remained stabilized at this level for several additional days By the twenty first hospital day the hemoglobin level had risen to 11 grams and the erythrocyte count to 2,800,000 without transfusions being given The patient was discharged on the thirty first hospital day with a hemoglobin level of 13 grams and an erythrocyte count of 3,500,000 At this time all serologic tests were negative

Discussion

The variability so characteristic of infectious mononucleosis and its laboratory findings also exists with regard to complicating hemolytic anemia, especially in the instance of serologic findings Case 1 showed positive direct and indirect Coombs tests and a negative trypsinized erythrocyte test case 2 showed negative direct and indirect Coombs tests and negative trypsinized erythrocyte test, but a significantly elevated hemolytic index (46 mg) case 3 showed negative direct and indirect Coombs tests but a positive trypsinized erythrocyte test The classical finding quired hemolytic jaundice, i e spherocytosis reticulo is erythroid hyperplasia and jaundice were com on to

The jaund ered was more intense than seen in the usual pau t acquired hemolytic jaundice or un complicates nonucleosis It was probably resultant from the c involvement seen in almost all cases in my exper jaundice was seldom encountered in the unco p when it was present, did not exceed 10 symptomatic hemolytic anemia should be essively increasing jaundice

The rec production (autoagglutinins and hemolysins) of the erythrocyte is vaguely stated to be fection antibodies become attached to th ant spherocyte formation and shortened ur

Treatment should most part except where the degree of hemoly of prolonged transfusion warrant blood transfusions and po therapy Splenectomy with prompt recovery has been in the instance

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Problems in Civil Defense

A ery long r nge t sk in ci il defense is to plan for the probable necessity of family and personal r habilitation on a scale which may be g gant c If a civilian popul tion can in fact withstand modern attack and f nally d feat it it will do so because enough of its members whose social funct ons ha e been disr pted can be brought rapidly ba k into effect ve roles This is a large prescr ption It goes far beyo d the matters of protection and physic l rehabilitat on of com munit e which are regarded as technically within the province of civil defense It involves details of economic policy social work com unitv planning psych atry and p bl c information which are hard to foresee accurately It will requ r a large number of prof ssionally skille l pe ple to carry it out and their skills will often be diff rent from tho e dema ded n the pr tection phase of defense B t this u dertak g may b the most important of ll

—DWIGHT W CHAPMAN

o B ll t f th At m S t t

SPLINT FOR FRACTURE OF GREAT TOE

CONRAD L ARNOLD *Ensign USNR*
WAYNE S MONTGOMERY *Lieutenant MC USNR*

FRACTURES of the great toe are usually caused by a blow from a heavy object, resulting in comminution of one or both phalanges and considerable tissue damage During the period of hematoma formation and edema, the toe is exquisitely painful, so that alleviation of the accompanying disability may become the major concern of treatment

Boot walking casts with toe pieces and reworked shoes with the toe pieces removed and extra soles applied both have their disadvantages Often it is desirable to apply hot soaks after the first 24 hours, or it may be necessary to dress associated wounds The Japanese wooden stilted "geta" has therefore been modified by Boatswain B A Steele, USN and the senior author to immobilize fractures of the great toe while overcoming these drawbacks and permitting the patient to return to duty

Figure 1 illustrates the construction and use of this sandal type splint Proper position and height of the stilts is essential The basic steps are as follows

1 The outline of the foot is traced on a sheet of paper and 1/4 inch is added on all sides

2 From the enlarged tracing a splint is cut from a piece of 1/2 inch plywood

3 Each of the two stilts is 1 inch wide and is cut to a length 1/2 inch less than the width of the splint at the point where it is to be attached so that the ends are set back 1/1 inch from the medial and lateral splint borders

4 The posterior stilt is 1 inch high and is placed in the center of the heel

5 The anterior stilt is 1 3/8 inches high and is placed midway between the anterior margin of the heel and posterior margin of the worn surface of the sole

From S [illegible] 3923 [illegible] Calif

6 A three legged metal guard may be placed over the injured toe if desired

7 The slipper is secured with a 2 inch elastic bandage as illustrated



F g 1

As an example of the successful use of this splint a boatswain who had sustained a crushing injury of the great toe with comminution of both phalanges was enabled to continue his supervision o the loading and unloading of ammunition at sea without m sing duty He traversed the ship s ladders and got about the deck with relative ease and freedom from pain

---

Hypertensive cardiovascular disease remains one of the foremost problems facing medicine today It has been estimated that one fourth of the adult population of this country has high blood pressure and that the complications of this condition account for more deaths annually than does cancer Hypertension is of particular importance because it is responsible for many deaths and much premature disability in young and middle-aged persons It is highly desirable therefore to lower the mortality for such a disease

—REGINALD H SMITHWICK M D and
JESSE E THOMPSON M D
in the Journal of the American Medical Association

WALKING APPLIANCES FOR FRACTURES ABOUT THE ANKLE

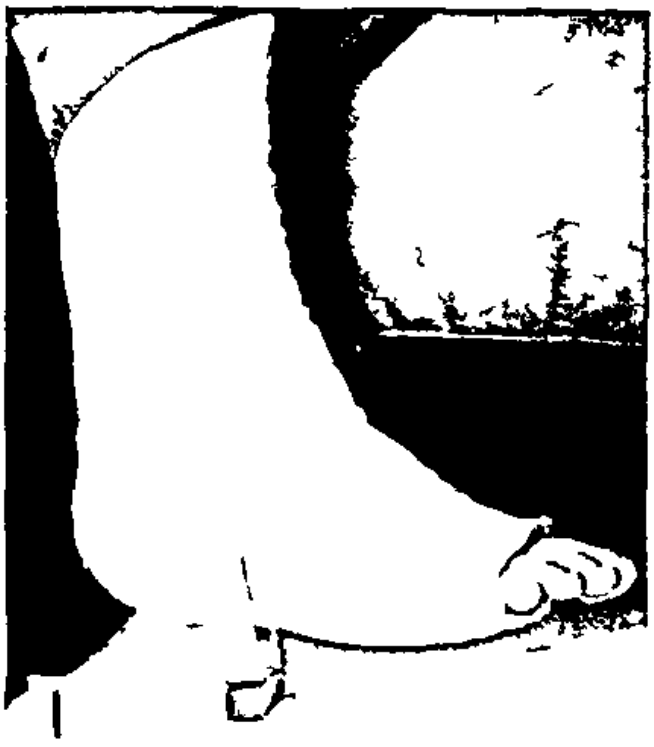
REECE R BOONE Jr *Captain USAF (MC)*

MANY devices have been used to permit weight bearing when the lower extremity is encased in a plaster of paris cast because of fractures at or about the ankle I have been interested in the use of these devices which, with *the* exception of the standard calipers, are seldom referred to in standard texts or in current literature [1 2]

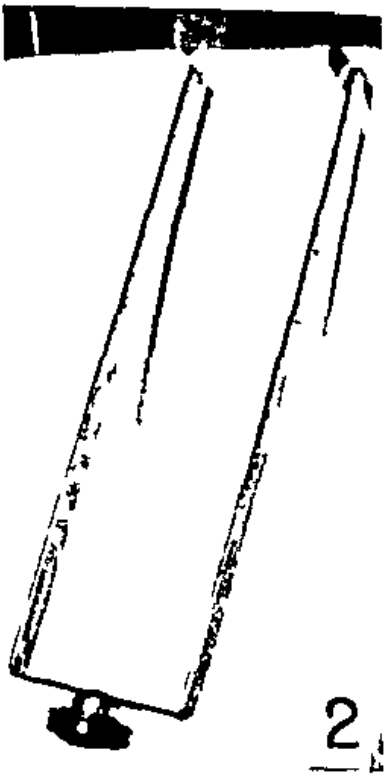
The principle involved in the use of walking devices is well known In fractures around the ankle the extremity is encased in a plaster cast with the foot at 90 *to* the leg, which extends from the fold of the toes to just below the knee If the cast is snugly fitted weight can be borne on the extremity without disturbing the ankle The weight is bypassed to the upper third of the leg because of the tapering of the leg from the knee downward Any appliance attached to the cast parallel to the tibia and alined with the direction of weight bearing is useful if it produces enough elevation to prevent the toes from being injured during locomotion

The standard issue caliper or walking heel (Stock No 3 731 000, Armed Services Catalog of Medical Materiel) is made of lightweight metal and has a rubber block attached to the crossbar by three small brads (fig 1) In my hands this device has proved to be unsatisfactory When walking in absence of the ability to flex or extend the ankle, the body is twisted as the uninjured limb is thrown forward After the patient had used this device for a few days, in almost every instance the small brads were twisted off, releasing the rubber block To overcome this defect I devised the appliance shown in figure 2 which has proved satisfactory The rubber bar was removed from the regular caliper and replaced with a metal plug with a heavy bolt welded to the crossbar The plug is tooled to house a small set of ball

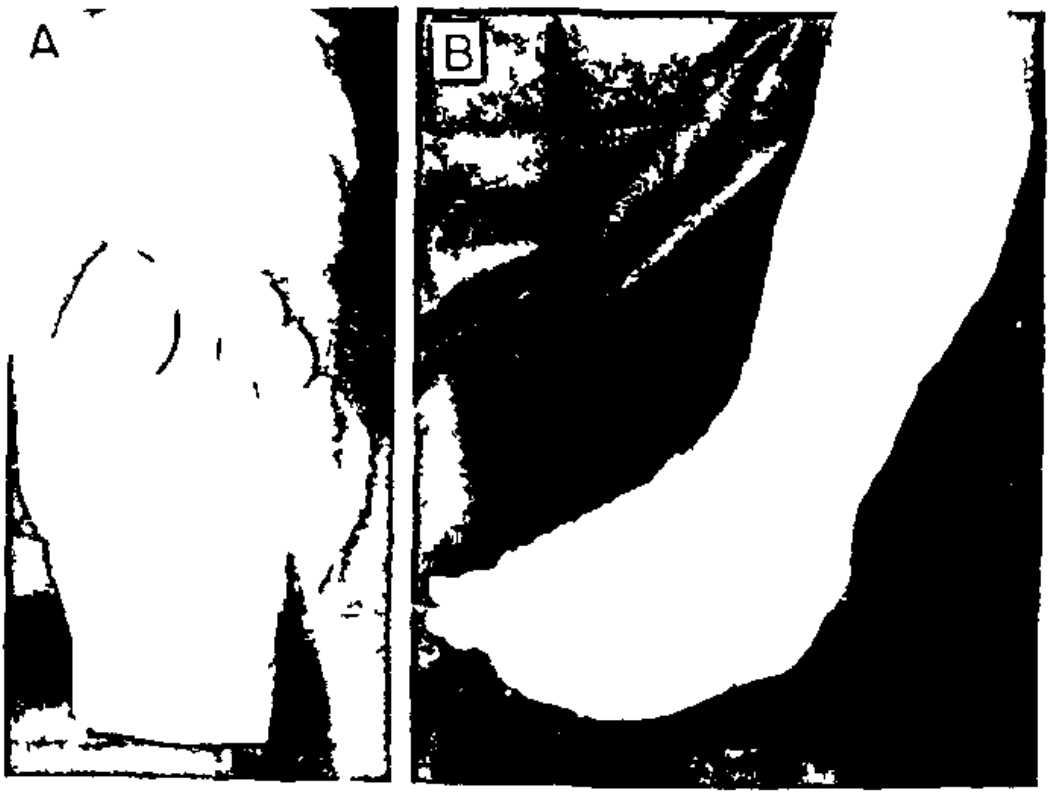
From the U S Air Force Hospital Orthopedic Service Air Force Base Maxwell Captain Boone is now stationed at Moses Lake Wash



F gur 1 Standard u lk g he l.



F gur 2 Mod f t on f tandard we u lk g h l.



F gur 3 A thor' rocker-type walker attached to ankl ca t

bearings and is covered with a heavy rubber cap to provide traction The plug rotates readily on the bearings and permits considerably easier propulsion

In an earlier device[3] the rocking motion from heel to toe closely simulated the normal gait and produced no more elevation than could be compensated for by use of a shoe on the uninjured foot with slight tilting of the pelvis This apparatus was bulky and presented difficulties for the patient in donning and removing his trousers The principle involved, however, was sound and led to the recent construction of the small, simple rocker shown in figure 3 This rocker consisted of a block of hard pine curved on the inferior surface and attached with screws to a thin flat sheet of metal that projected five eighths of an inch on all sides This flang permitted easy attachment to the bottom of the cast. A strip of corrugated rubber was glued to the curved surface of the block to permit adequate traction This apparatus has been used satisfactorily on three patients

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Great Discoveries

We seem to forget that in the past great discoveries have with few exceptions been made by individual workers often working in great isolation that some of the most important discoveries have been made without any plan of research—largely by accident or in dreams as in the instance of Loewi s Nobel prize winning discovery that discoveries have resulted from a general state of what has been called puzzlement—puzzlement at discrepancies in findings—a state of *mind which would not lend itself to any accurate verbal description* that there are researchers who do not work on a verbal plane who cannot put into words what they are doing—whose thinking functions in terms of experiences subconscious observations—who don t know what they have been after until they actually arrive at their discoveries

—CURT P RICHTER
in *Science*

Regular Medical Corps Officers Certified by Specialty Boards

The American Board of Obstetrics and Gynecology

This board was founded in 1930 and on 30 June 1953 had issued a total of 3 908 certificates to physicians qualified in these specialities Of this number 47 are regular Medical Corps officers of the three military departments according to current records in the Offices of the respective Surgeons General They are

Elw N Aker *Lt Col USA*
S I L A *Lt. Col USA*

W ll m S B k *Comdr USN*
Erv S B ll *Comdr USN*
H rvey C B yd *Lt Col USA*
Cha l I Bry *Maj USA*

Ge g C. Cald wood *Comdr USN*
Dw gh A Call g *Lt. Comdr USN*
R y E C wd *Comdr USN*

L w T D g *Capt USN*

Ma A G d *Comdr USN*
Har ld B Gr *Lt Col USA*

W l N H on *Comdr USN*
Lou H rt *Capt USN*
H l l E H *C l USA*
R ha d A H yd *Maj USA*
H ld H H ll *Comdr USN*
Har ld H bl d *Capt USN*
F ed k C H pp *Lt C l USA*
Edward B H ppe *Comdr USN*
H nry J Hun *Comdr USN*
J ph W H *Comdr USN*

Be j m H J l j *Lt Col USAF*

Ha ld M J *Lt Col USA*

Edw d T K wl *Capt. USN*
G g J K h *Comdr USN*

J m H L *Lt. USN*
B onk P L l h *Lt Col USAF*
J m P L g J *Capt. USN*

J h A P *Lt Comdr USN*
Asm d J Pereyr *Capt USN*
P l P *Capt. USN*

H mbe L R *Lt Col USA*
L ur G R h *Lt. USN*
D ni l H R w *Maj USAF*
M rr M R b *Capt. USN*

J h W S mp *C l USA*
W ll m A S m h *Comdr USN*
F d B Sm h *Capt USN*
J m H Sm h *Lt Col USA*
R be C G Sta ley M j *USA*

R y W T ady *Comdr USN*

Alb T W lk *Capt. USN*
Ch l E W be *Lt. Comdr USN*
Elwood L Wool y *Comdr USN*

J h S Z l k *Lt Col USA*
Edw d A Zimm m *Col USA*

Th h h d f er Th name f ll er f d by h Am B d f De ma l gy d Syph l l gy d P diatr w ll be p bl h d h J uary l

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W lk W J L Col MC USA R l t hip f d p y um h l et l d l popr l l nd th ir mod f by d tary m *Ann. Int. Med.* 39 705-716 O 1953

The doctor who takes a poor history does not look at the patient and accepts unthink gly the diagnosis that is handed him by the laboratory assistant or the roentgenologist is daily making terrible blunders Many of the things he diagnoses are silent a d symptomless and have nothing to do with the pat ent s illness The saddest feature of all this is that th s push-button type of decerebrate medicine is being practiced not so much perhaps in the villages as in the university centers

—WALTER C ALVAREZ M D
in the *New England Journal of M d cine*

Deaths

BROTN Clarence Raymond Lieutenant Colonel MC USA Percy Jone Army Hospital Battle Creek Mich graduated from University of Tenne ee College of Medicine in 193 commissioned a first lieutenant in 1941 served in Europe in World War II died 5 July 1953 age 41 of coronary occlusion

CAMPBELL James McLain Lieutenant Colonel MC USAR Camp Chaffee Ark. graduated from University of Tennessee College of Medicine in 1933 commissioned a lieutenant colonel on 1 July 1953 died 5 August 1953 age 43 of coronary thrombosis while enroute to Camp Chaffee from F rt Sam Houston Tex

COCKS Charles Edward Jr Colonel MC USA Letterman Army Ho pital San Francisco Calif graduated from University of California Medical School in 1933 commissioned a first lieutenant 13 May 1933 served in the Philippine Islands and the Far East Command died 29 September 1953 ge 45 of coronary occlusion

COLER Euge e Seeley Colonel USAFR (MC) U S Air Fo ce Hospital South Ru lip England gr duated from M G ll Univer ty Faculty of Medi in n 1922 o dered to active duty 14 May 1951 cert f ed by Ame can Bo d of Ob t tric and Gynecology Fellow of American College of Surgeons a ociate cl n cal professor of ob tetrics and gynecology Columbia Un ers ty College of Physicia and Surgeon d ed 30 August 1953 age 59 of myoc dial inf ct on at Denham B kt gham h re E gland

COLLINS Leonard J mes Jr Lieuten nt MC USNR U S N val Hospital J cksonville Fla graduated from Southw stern Medical School of the Uni ersity of Texas in 1947 o dered to active duty in May 1952 d ed 6 June 1953 age 29 of pulmon ry edema and ca diac arr st

KFANE James Patrick First Li utenant USAFR (MC) Lockbourne Air Force B se Ohio graduated from St Lou s University School of M dicine in 1948 ordered to active duty on 28 March 1953 died 30 July 1953 age 30 in an aircraft ccident near Olmstead Ohio

KILEY Helen Mary Captain USAF (NC) U S Air Force Hospital W esbaden Germany commissioned first l eutenant 15 Nov mber 1946 d ed 14 September 1953 age 39 of denocarcinoma of kidney with multiple metasta es at Walter Reed Army Hospital Washington D C

LUTES Le ter L Major MC USAF U S Air Force Hospit l South Rui lip England gr du ted from Un er ty of Ten essee College of Me i i 1941 comm io ed a f r r li ten nt on 15 October 1941 i 1 14 April 1953 age 4(n a t mobile ccident n r Chelt nh m England

McCASLIN H gh Towles F t Le t nant USAFR (MC) U Air F School f Av at on Med e R ndolph A r Forc B Columb Un er ty Coll ge of Phy and S to c d ty 12 Febr y 1953 Arm H sp t l Te of injur r c

NORRIS J m s E t L t n t MC USNR N 1 S on T ur I land S Fra Cal f g duat d f m U ty f Chic g Sch l f M d in 1949 c mm o d l t nant 1949 rved i th k Camp g t f d by N t nal Bo d f M d l F miners d d 12 Jun 1953 g 27 t U S N l H p t l O kl d Cal f

RHAMY R hard Al F t L t MC USAFR U S Air Forc School f A t M d R d lph A F c B T g dua d from I d U y Sch l f M d 1951 t d t rv on 19 Ap l 1953 d d 1 J ly 1953 g 24 f r mat c b l t l p mo th w th e o-emb l m

SATINF B na d Al M j USAFR (DC) O l d A F B s Fl gr duat d f m T mpl U ty Sch l f De t try 1942 ord d to t duty 6 J ly 1948 d d 27 A g t 1953 g 36 f m d w g th ul f a m b l d Ca l P int Fl

ZFMBA G g W ll m L t DC USNR L kbour A For R Oh gr d d f m W t R U ty Sch l f D t try 1944 d d d y N mbe 1952 d d 30 J ly 1953 g 35 f d t Olm t d Oh

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Poliophobia

During epidem cs dread of poliomyelit s is so great that any type of complaint may be nt rpreted s a da gerous evidence of disease Prodr m l ymptom tology is involuntarily imitated hysterical paral ys s m y ppear and hyperventil tion or feeling of suffocat on may suggest respiratory in olvem nt C mplete aphonia and a sluggish gag reflex m y be encountered Persons may complain of a lump in the thr at nd m y fe that bulbar involvement is de eloping Whe the persons re xam ned ingenuity may reveal that an apparentl paralyzed muscl actually functions in one type of movement tho n t n ther Deep tendon reflexes are normally brisk and freque are f hyperesthesia or paresthesia having bizarre distribution d scrib d None f the abnormal find ngs persist during sleep tem tur t gn f c ntly elevated bladder and bowel functi rm l and paralyt c findin$_g$s often are altered by suggestion tr t n for the p tient s benefit of normal spinal fluid has n particul ly h lpful in my e perience An understanding att t rep ated phy ical examin tion to confirm the absence of real d tog ther w th pre cription of rest are usu lly adequate t an ty and thu dicates s gns of illness

—CLIFFORD G GRULEE JR M D
n the *Journal of th American Med cal As*

BOOK REVIEWS

Surgery of Trauma edited by *Warner F Boue s* Colonel MC USA 605 pages 284 illustrations J B Lippincott Co Philadelphia Pa 1953 Price $15

The purpose of this book is to present wound healing in cor relation with biophysical chemical, bacteriologic and mechan ical factors This general picture is supplemented with specific attention to the special systems and organs and their reaction to injury The problem of regional wound surgery is considered by various specialists and the military and research facets of the problem are discussed in subsequent sections

This publication is a compilation of the experience and knowledge of 42 contributors Many levels of experience and a multiplicity of specialties are represented with varying degrees of excellence There is some overlapping of content between the various essayists and minor repetition in the copious documenta tion of the literature that follows each chapter This volume must be read with discrimination because every contribution is not equally authoritative For this reason it is probably not desirable for use by medical students Physicians in the military service and in civilian practice who may be faced with the problem of treatment of trauma, will enjoy this collection and correlation of various aspects of trauma and its therapy

The occasional editor s note or contribution brings some order to unorthodoxy I or example the problem of tourniquets is editorially settled after debatable dogma has been presented The section on evacuation distribution of casualties might well be the only service paid to this problem instead of having spotty pronouncements made on this matter throughout the text by other contributors

The section on ballistics is fascinating and although far from clinical gives interesting background on the production of trauma Other high points not previously mentioned are the physics and physiology of the specific effects of craniocerebral wounds the discussion of battle and nonbattle trauma to hands and the therapy required the dogmatic but effective section on genitourinary trauma and the section on maxillofacial trauma with its excellent pictures and schematic drawings based on pictures of actual cases presented

This volume presents well qualified authorities who have assembled and presented orthodox and sound discussions of problems relating to wound healing trauma its results and the therapy of the various disturbances that occur in its wake

—Col D S Wenger USAF (MC)

D f M s l A St dy P th l gy by R ym d D *Ad* ms M A M D A t Cl l P of or f N ur l gy H d M d c l School Ch f f N l g l S rv M ch tt Ge ral H p t l F me ly Vi t g N l g t d N ur path l g t N ur l g l U B ton C ty H p t l *D D y B oum* M D D Ph l F R C P J m J k P tnam Pr f f N ur l gy H rd Med l S ho l D or N ur l g l U t d N ur l g t Ch f B to C ty H p t l d *C l M f n,* M D F m R d P th l gy M ll ry l t t t f P th l gy B t C y H p t l 556 pag 317 ll t P l B Hoeb I N w Y k N Y p bl h 1953 P $16

This is the first book in the English language with a comprehensive account of the various muscular disorders It is divided into three major parts The first deals with embryology normal histology and the innervation and vascular supply of skeletal muscle It includes a discussion of the chemical basis of muscular structure and function and a short but detailed account of the relationship between muscular contraction and neuronal activity The second part deals with the pathologic reactions of skeletal muscle with 90 pages devoted to experimental pathology in denervation atrophy disuse atrophy reaction to injury circulatory disorders experimental infections and deficiencies The concluding chapter of this section is devoted to the general reactions of muscle to disease The third part considers the pathology of muscle diseases congenital defects the dystrophies inflammatory conditions tumors traumatic and circulatory diseases spinal and neural muscular atrophies and miscellaneous diseases The concluding chapter of the book concerns differential diagnosis and suggests methods of obtaining and preparing muscle tissue for pathologic study

The text is profusely illustrated with excellent photomicrographs and electromyograms Each chapter is concluded by an extensive bibliography of both English and foreign literature This work is more than a study of pathology it is rather a study of clinical pathologic correlation with a survey of anatomy and physiology for the background The writers are to be complimented for their perspicacity in compiling such diversified facts concerning diseases of muscle It is a book which will be of value not only to the resident and practicing pathologist but to the experimental pathologist the internist the neurologist and the surgeon —*Lt C E Boonstra MC USN*

Textbook of Pharmacology for Nurses by *Ma gene O Faddis* R N M A Professor of Medical Nursing Frances Payne Bolton School of Nursing Western Reserve University Cleveland Ohio assisted by *Joseph* \ *Hayman* Jr B A M D Dean Tufts College Medical School formerly Professor of Medicine School of Medicine Western Reserve University 4th edition 520 pages 106 illustrations J B Lippincott Co Phila delphia Pa publishers 1953 Price $4 50

The fourth edition of this textbook has been thoroughly reorganized and revised to include the latest developments in drug therapy It follows the same format as the previous edition, but some of the material has been rearranged and new information added The book is profusely illustrated and contains 31 chapters, each followed by a bibliography

That the authors had the student nurse in mind at all times is evidenced by the clear and concise wording as well as by the numerous diagrams and examples of mathematical equations to clarify the meaning of formulas and rules They have achieved their objective of emphasizing the application of knowledge rather than the mere accumulation of facts, with the purpose of making an informed and responsible nurse out of an interested student All nurses will find this text very interesting reading and an excellent source for reference —*Lt Comdr A Danyo NC USN*

Pract cal P dodont a or Juvenile Op rat ve D ntistry and Public Health Den tistry An Int odu tory Text for Student and Pr ctition r of Den tistry by *Floyde Eddy Hog boom* D D S F A C D Profes or of Children s Denti try College of Dent try Un e ty of Southern California 1921 1949 Fo me Memb H lth a d Development Depart ment Pasadena City School Former Memb r of Ch ldr n s Hospital St ff Los Ang le Chairm n Dent l A tant Cour Lo A gele J nior College Los Angeles 1930-3 Special Chapt r by *Forrest A derson* M D Sc D (Med) former D rector *Child Gu da ce Cl c* of Los Angeles and Pa adena special l ctur r n Mental Hygiene University of Californ *Ha ld Hauk ns* D D S Ch o Cal f former Associate Professor of Bacte logy nd Preventi e De t stry Coll g of D ntistry Un r ty of So the Cal for *Thadd us P Hyatt* D D S F A C D former Profes or of Pre ntive Denti try N w York Univer ity College of Dentistry former Director Dent l Dep t ment *Metropol tan* L fe Insuranc Co a d *Ha ry E. St a k* D D S special Instructor in Exodont nd Minor Surg ry former F culty M m ber Colleg of Denti try Un ers ty of Souther Cal for a 6th ed tion 642 p ge illu trat d The C V Mo by Co St Lo Mo p b- lisher 1953 Pr c $12 50

The authors of this book attempt to encompass so much in the field of dentistry that many of its sections are generalized and cursory The introductory chapters are devoted to a résumé of the economics and the business a pects of the practice of dentistry with a brief presentation of the psychology of child management The succeeding chapters deal with the embryologic growth of the face particularly in its relationship to the development of the oral structure A large portion of the remainder of

the book is given to an interesting well arranged discussion on the deciduous teeth the methods and materials used in the control and treatment of caries and an excellent chapter on the prevention and inhibition of caries in the adolescent In addition to a detailed practical discussion of the fluorides there is an excellent chapter on the role of nutrition and the biochemical aspects of caries The chapter on anesthesia is inadequately presented because it is limited to a generalized discussion of but a few of the many anesthetic agents applicable to children The concluding chapters on preventive orthodontia endocrinology and public health are interesting and well written

Because of its broad coverage this book is not a complete book on pedodontics It should be of value for the student or as a ready reference for the young practitioner

—Lt Col A M Mohnac USAF (DC)

Emotional Factors in Skin Disease A Psychosomatic Approach Medical Monograph by E Wittkower M D and B Russell M D with contributions from Peter Edgell M D Raymond Ingersoll M D and Joseph Sobel M D foreword by Dr R M B Macleod Edited by Dr E C Mendenhall 214 pages Paul B Hoeber Inc New York N Y published 1953 Price $4

This monograph is the joint effort of four psychiatrists to one dermatologist and the opinions expressed reflect that ratio of collaboration The volume is divided into two parts each with three sections or chapters The conditions discussed not well documented include pruritus vulvae pruritus ani eczema poikilodermia psoriasis seborrheic dermatitis urticaria acne vulgaris rosacea and alopecia The authors use charts to a questionable advantage because they do not always confirm the conclusions offered The section on alopecia is labored and overwritten and the account devoted to urticaria is unconvincing Little attention is paid to control studies

It has been difficult for this reviewer to be entirely objective in appraising and reporting on this work because he has been influenced by a similar lack of objectivity on the part of the authors in their arbitrary and easy manner in making their points The book is interesting however provocative and with the exception already noted well written A series of prefaces including one by Mackenna are especially recommended The book has been directed to the practicing physician and the dermatologist but it is actually in the psychiatrist's domain

—Capt R L Gilman MC USN

From the Workshop of Dr by O Loewi Research Professor of Pharmacology New York University College of Medicine Public Lectures Series 1962 page University of Kansas Press Law rence Kansas published 1953 Price $2

The first of three lectures by Dr Loewi at the University of Kansas, entitled "Reflections on the Study of Medicine," is a broad, philosophical essay for medical students He cautions against the dogmatism created by textbooks and advises students to feel like architects having before their mental eye the building to be erected and making the selection of the material accordingly " In the second lecture, which gives the book its title, the author draws on his rich experience in research to distinguish several modes of discovery including those made by chance, intention, and intuition or imagination He recognizes all three as important but argues that observations are not discoveries unless the observer recognizes their importance His own discovery of the chemical transmission of nerve impulses, for which he was awarded a Nobel prize, is attributed to intuition The last lecture entitled, Problems in the Field of Adrenal Function," is best explained by his first sentence "Many aging scientists have an ever growing drive to integrate single facts into a whole, which frequently leads to oversimplification " The book provides delightful, stimulating reading well illustrated by apt quotations It is fortunate that we have such a means of becoming better acquainted with one of the great scientists of our time —*Lt Col P A Smith USAFR (MSC)*

Chronic Pulmonary Emphysema Physiopathology and Treatment Modern Medical Monographs No 8 by *Maurice S Segal* M D and *M J Dulfano* M D 180 pages illustrated Grune & Stratton Inc New York N Y publishers 1953 Price $5 50

The present knowledge of chronic pulmonary emphysema is covered fully in this book, and its classification and development is discussed from a physiologic and pathologic point of view A separate chapter is devoted to pulmonary function studies and their clinical concepts are well presented The prevention and treatment of the carbon dioxide intoxication syndrome is described and a discussion of pulmonocardiac complications of chronic pulmonary emphysema is included Chapters 7 to 13 are devoted to various phases of symptomatic treatment, the use of aerosols, ACTH and cortisone, oxygen, mechanical respiration and pneumoperitoneum Anatomic and physiologic phenomena are skillfully described with very good illustrations There is an excellent bibliography and the section on methodology increases the value of this monograph considerably The book is well written concise and valuable to those physicians interested in chronic pulmonary diseases —*Col M F Grooter Jr USAF (MC)*

Fibrocystic Disease of the Pancreas A Congenital Disorder of Mucus Production—Monograph edited by *Martin Boda* M D 44 pages illustrated Grune & Stratton Inc New York N Y 1953 Price $3 50

The careful analysis of 116 case reports in this monograph forms the basis for the concept of fibrocystic disease

pancreas The tables graphs reproductions of pathologic specimens photomicrographs clinical photographs and roentgenograms are unusually good

Initially a brief review of the literature by the outstanding investigators in this field is presented to give background for further elaboration and presentation of clinical material The special study on familial incidence presents strong evidence to support genetic factors as a cause of the condition the simplest and most likely hypothesis being that of a recessive gene It is concluded that the eugenic prognosis makes it likely that one in four of each further child of parents who have a child with this disorder will have the same condition

The chapter on the pathology of the condition is especially well presented The initial statement that the name of the disease is misleading because of frequent abnormalities in other viscera is strongly supported The fundamental pathologic changes observed are explained as an inborn error of mucous secretion throughout the body The disease is defined as a congenital mucosis because the pathologic lesions have been shown to affect the tissues wherever mucus is produced

This monograph will be of particular interest to pathologists and pediatricians —*Col C T Young MC USA*

Str Incont en n th F m l by *J b C Ull ry* M D 149 page il lu trat d Gr n & Str n In N w Y k l Y 1953 Pr c $6 75

This excellent monograph fulfills the author s purpose of presenting a critical study of the anatomy of the urethra bladder and pelvic fascias the physiology of micturition the alterations and pathologic physiology that occur to bring on stress incontinence the methods of diagnosis and a broad survey of the problems of treatment in a manner that will be of value to the student general practitioner and specialist

The subject matter is divided into seven chapters About one third of the volume is devoted to the work of numerous investigators in embryology and anatomy of the urogenital system The detailed findings of these reports are then assembled in an orderly understandable summary clarifying confusing descriptive reports from the earliest investigators up to the present. Another outstanding chapter covers all aspects of treatment and discusses in detail all surgical procedures The author has an excellent, easily read style and has organized his material well Many of the illustrations are selected from other texts and journals There is an adequate index and an extensive bibliography This splendid monograph now provides in one volume all the important data of stress incontinence in the female for the physician who treats this condition

—*Col H E Ha IC USA*

Multiple Myeloma by *I Snappe* A D *Louis B Turner* M D and *Hot ard L Moscov tz* M D 168 pages illustrated Grune & Stratton Inc New York N Y 1953 Price $6 75

In this monograph the authors summarize the existing informa tion concerning multiple myeloma and delineate the defects in our present knowledge of this disease They also present a series of 97 cases observed over a seven year period Many of these patients were studied extensively and the data collected from these studies adds considerably to our knowledge of the disease Of particular interest is the chapter on the metabolic abnormalities in multiple myeloma in which the nature of Benco Jones protein and the abnormal serum globulin as studied in the author s laboratories is discussed Although no absolute con clusions are reached, many deductions based on sound reason ing are made The chapter on treatment is valuable because it probably represents the largest series of treated patients avail able Throughout the work, there is a strong clinical tone which will increase the diagnostic capabilities of any reader

—*Maj R B Schmidt MC USA*

Parodontal Disease A Manual of Treatment and Atlas of Pathology by *E Wilf d F sb* C B E M D (Manch) D D Sc (Melb.) D Sc (Lond) F D S R C S (Eng) 2d edition 252 pages illu trated J B Lippincott Co Ph ladelphia P 1953 Price $6 75

This volume contains a compact discussion of periodontia, and is an improved version of the 1944 edition Without intending complete coverage of the field the author presents his own rationale of treatment, with adequate references to the histologic and pathologic aspects of the subject The discussion is written in a direct, almost personal manner The bibliography common to authors in this country, is deliberately omitted In its place each chapter concludes with a concise and helpful summary of the material presented

The sections of ogy, classification, and treatment are presented reason ably and directly There is additional coverage of gin ing including individual case management complication ulties and the relation of diagnosis to treatment. will consider the treatment of scaling curettage too d many might miss the implication that restoration are an essential part of the treatment plan The atl however is a miniature gem with clear photom ularly in the author s classical exposition of t n in bon

Paradontal though brief practical hand book of period it earns a definite place on the referenc

Lieut Col W M Triplett (MC)

pancreas The tables graphs reproductions of pathologic specimens photomicrographs clinical photographs and roentgenograms are unusually good

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This monograph will be of particular interest to pathologists and pediatricians —*Col C T Young MC USA*

Str In ont c th Fem l by *J b C Ull ry* M D 149 pag l
l tra d G & St In N w Y k N Y 1953 P ce $6 75

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The subject matter is divided into seven chapters About one third of the volume is devoted to the work of numerous investigators in embryology and anatomy of the urogenital system The detailed findings of these reports are then assembled in an orderly understandable summary clarifying confusing descriptive reports from the earliest investigators up to the present Another outstanding chapter covers all aspects of treatment and discusses in detail all surgical procedures The author has an excellent, easily read style and has organized his material well Many of the illustrations are selected from other texts and journals There is an adequate index and an extensive bibliography This splendid monograph now provides in one volume all the important data of stress incontinence in the female for the physician who treats this condition

—*Col H E Harrison MC USA*

Through the next century the legend of the Cane inspired such men as Sir William Osler, who also embodied the traits of those who had actually carried the Cane From time to time new editions of MacMichael's work were published, of which the second and sixth, like the first, have become collectors' items This handsome seventh edition contains the text and illustrations of the notable 1923 fifth edition, including the introduction and annotations of George C Peachy In the new Preface, William J Kerr, M D , tells how the legend is currently used to stimulate interest in the aspects of a physician's training not directly measurable in terms of grades and scholarship Each year a senior at the University of California School of Medicine becomes the bearer of a Gold Headed Cane, an award based upon his interest in the welfare of patients displayed during his entire clinical experience This edition of *The Gold Headed Cane* together with Dr Kerr s preface, gives new meaning to a legend which has already become timeless —*W W Link Ph D*

Operative Surgery Volumes I and II by *Guy W Hosley* B S M D and *Isaac A Bigger* M D 6th edition 1 579 pages Illustrated by *Helen Lorraine* The C V Mosby Co St Louis Mo 1953

The two authors and 18 contributors have ambitiously undertaken in this sixth edition a discussion of general surgery in its broadest sense There are sections on technic, general principles anesthesia, vascular surgery, plastic surgery thoracic and cardiac surgery, abdominal surgery orthopedic surgery urologic surgery gynecologic surgery, and neurologic surgery The 1 274 illustrations are good particularly in regard to plastic surgery

The operations discussed and described are primarily those that have proved to be most satisfactory in the hands of the authors There is a plea for, and considerable time devoted to the physiologic approach and individualization of surgical problems These cannot be considered volumes on surgical technic for, obviously with such a large field to cover details of all the operations discussed cannot be presented The sections on orthopedics gynecology et cetera have been wisely allotted to specialists in those fields however they occasionally lose sight of the fact that these volumes are written primarily for the general surgeon and discuss procedures that would best not be handled by a general surgeon Although frequent references within the text indicate that recent literature has been fully reviewed the bibliographies following each chapter are for the most part not up to date

These volumes are well and interestingly written and should be valuable as an adjunct to a teaching program The broad aspects of the subject matter also make them worth while for reviewing the entire field of surgery —*Comdr F C Spar MC USN*

H lt P d tr c by L *Emm t H lt J* d *Rust M I t h* 12th d on 1 485 p g ll tr t d Appl t Ce tury-Cr ft Inc N w York N Y 1953 P $15

This twelfth edition of the well known Holt pediatric text series which was first published in 1896 is really a new book rather than a revision of an old one Doctors Holt and McIntosh have edited the contributions of 72 contributors into a concise and smoothly written text. The basic organization of the eleventh edition has been retained but there are 39 more contributors an improved type and much new material on fluid balance antibiotics and therapeutics The authors present both sides of controversial material and state where real information is lacking on a subject. They do not burden the reader with confusing speculation nor mislead him by undue emphasis on unproved theories to which they may be partial They include enough basic science background to enable the reader to be aware of pertinent laboratory tests and experimental work without overwhelming him with a welter of equivocal or nonessential research data or clinical laboratory technic

Especially good are the discussions of fluid balance epilepsy celiac syndrome diabetes mellitus smallpox, tuberculosis therapeutics of allergic eczema heart murmurs and toxoplasmosis and the graphic description of tuberculous meningitis

Obviously in a book of this size which takes five years to write there will be some ideas with which a reviewer will disagree and some of the newer ideas in diagnosis and treatment will not have been included For example the use of hexachlorophene in a liquid soap or lotion gives better protection against skin infection than cleaning with oil Preventable skin infection in the newborn may result especially in hot weather if the infant s bath is delayed until the cord drops off Close attention to the umbilical cord is necessary during the first few days to prevent the development of a foul cord

In view of the many substitutes for pooled plasma its use is being abandoned because of the incidence of serum hepatitis that occurs even with irradiated plasma In the discussion of atelectasis of the newborn bronchiolitis and croup no mention is made of the use of aerosol therapy with the alveolar detergent. In the treatment of dehydration with secondary anuria the logic of potassium administration before renal function has been restored is doubtful Contrary to the impression given by the book most strains of *Bacillus pyocyaneus* are only sensitive to polymyxin B internally or to 5 percent acetic acid externally

In the discussion of tuberculosis the existence of false positive tuberculin reactions in infants tested with second strength PPD should be noted and the fact the low spinal fluid

chlorides may be helpful in the diagnosis of tuberculous men ingitis should be mentioned In the presentation of renal disease, congenital aplasia of the kidneys in the newborn has been omitted Many authorities would not agree that the average patient with acute nephritis should be up and around in six weeks, with no attention paid to Addis count

The treatment of intussusception as outlined may be satisfactory in a large center where the patient can be taken directly from the x ray department to the operating room in case reduction cannot be accomplished by the barium enema, but might be inadvisable where such ideal conditions do not exist. The use of ACTH and cortisone in the treatment of rheumatoid arthritis in children has been widely abandoned because of the rebound phenomenon The discussion of the pneumonias is good, but the terminology employed is confusing Four terms are used for bronchiolitis, and two each for what many call bronchopneumonia and lobular pneumonia Students would welcome some standardization of terminology

A young physician might be fully cognizant of the material in this book yet be unable to answer the queries of mothers regarding such homely matters as dressing feeding, bathing, habit formation and growth and development of normal children A chapter or two on office and home practice in pediatrics would be of help in a standard reference like this

The few faults mentioned are of a minor nature The book in its entirety is an excellent effort to encompass a vast amount of ever increasing and changing material within the confines of a limited space It can be recommended to any person interested in pediatrics —*Lt C W Trossman MC, USN*

The Action of Insulin by *Niels Haugaard* Ph D and *Julian B Marsh* M D 113 pages illustrated with graphs and charts Charles C Thomas Publisher Springfield Ill 1953 Price $3 75

This monograph presents a survey of the current knowledge of the action of insulin There are chapters on intermediary metabolism, chemistry and physiology of insulin, experimental diabetes diabetic metabolism, the relationship of pituitary and adrenal factors, clinical aspects and mechanism of action of insulin Pertinent tables graphs of data and a good index are included

This book fulfills the purpose for which it was written It should be valuable to the clinician and student who is interested in a better understanding of the physiology and chemistry of insulin and to the research worker as a summary and reference monograph It should be in every library and carefully read by all who prescribe insulin

—*Lt Col S H Sandifer MC*

Ind idual d Comm ity H lth by W ll m W St l M D M P H 492 P g ill tr d Th Bl k t C N w Y k N Y 1953 P $6

This volume apparently is written for college students and is designed to add to their cultural and professional knowledge and to help keep them in good health during and after their school years Historical statistical and technical information concerning the widest possible variety of problems related to the field of health is well presented and illustrated

The author outlines six objectives of health education for college students the promotion of health and the prevention of disease the development of a social conscience the integration of individual and community health the direction of overt behavior and conduct preparation to accept responsibility as an individual and as a group member for action leading to the solution of individual and community health problems and the development of the proper scientific emotional and social attitudes toward oneself and one s associates The subject matter is comprehensive and inclusive and is illustrated with historical highlights

The author presents a brief encyclopedia of the more common injuries diseases and afflictions of mankind throughout the world and the importance of prevention of disease and injury The final chapter presents a resume of career fields in the sciences of health and hygiene and a short history of advances in these fields from 3 000 B C to the present. The references gathered at the ends of the chapter sections are exceptionally well chosen and the index is extensive

—*Col C H Moseley MC USA*

The Spirit of Man

The public at times thinks of the verage physician as a happy mixture of ntellectual nnocence d worldly wisdom b t when that same publ c ll it expects from the physici n integrity human ty and skill It is prec ely becau e it has not looked in vain for these things that medicine st ll an independent group in society holding its own co ncils and governing its own members There is much talk in d ys of just fying medic ne by its benef ts to society prolonging life and so forth These thi g are self e dent The re l justif cation medicine lies at the deeper le l Its concern has been with the *of man a mission which it shares with rel g on*

—E P SCARLETT M D

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